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ARITHMETICK MADE EASIE,

According to the NEW METHOD
Now Taught and Practis'd in
LONDON.

WHEREIN
The RULES of that Neceſſary ART are briefly Explained, and Illuſtrated with ſuch familiar EXAMPLES as may ſuit the meaneſt Capacity, if they deſire to learn it.

To which is added,
A Succinct Treatiſe of *Decimal Fractions*, with Compleat TABLES, RULES, and EXAMPLES demonſtrating the ſame. The like not Extant in any other TREATISE of this Nature.

By JOHN COPELAND, *Writing-Maſter.*

The Fourth Edition.

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BRITISH MUSEUM

To the Worſhipful
Sir *Francis Child*, Knt.
PRESIDENT,
The Worſhipful
Thomas Lockington, Eſq;
TREASURER,
And the reſt of the Worſhipful the
GOVERNORS
OF
Chriſt's Hoſpital, London.

This MANUEL of
Practical Arithmetick
Is moſt Humbly Dedicated
By Your Worſhips moſt Obedient,
and moſt Humble Servant,

John Copeland.

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ADVERTISEMENT.

WRITING and ARITHMETICK are carefully taught by the Author, at the *Hand* and *Pen* in *New-Street*, in *Shoe-Lane*, near *Fleet-Street*, *London*.

ARITHMETICK Made Eaſie.

CHAP. I.

Concerning Numbers, with a Table of NUMERATION.

NUMERATION is the Firſt Part of Arithmetick which ſhews how to expreſs or pronounce the true Value of any Number by Ten Figures or Characters, of which the laſt is called a *Cypher*, and of it ſelf ſignifieth nothing; but being added to the Right hand of any other Figure increaſeth the Value: Which Figures are as follow, *viz.*

One,	*Two,*	*Three,*	*Four,*	*Five,*	*Six,*	*Seven,*	*Eight,*	*Nine,*	*Cypher.*
1,	2,	3,	4,	5,	6,	7,	8,	9,	0.

1ſt. The nine firſt are ſignificant Figures, any one of theſe Figures is called a *Single Number*, as 3, 5, 8; but being joined with any other Figure, as 68, 76, is called a *Double* or *Compound Number*.

Note, That in any Number there are ſo many Places as there are Figures.

2*dly*, The Order of the Places is from the Right Hand to the Left; ſo the outermoſt Figure towards the Right Hand is the firſt Place, and the outermoſt Figure towards the Left Hand is the ninth or laſt Place.

3*dly*, The Places proceed in a ten fold Proportion; The firſt Place is the Place of *Units*, wherein a Figure ſhews its own ſingle Value; the ſecond is the Place of *Tens*, wherein a Figure ſignifieth ten times its own ſingle Value; the third Place is *Hundreds*, wherein a Figure ſignifieth an hundred times its own ſingle Value; the fourth is the Place of *Thouſands*, wherein any Figure ſignifieth a thouſand times its own ſingle Value; the fifth is the Place of *Ten thouſand*, wherein any Figure ſignifieth ten thouſand times its own ſingle Value; the ſixth is the Place of *Hundreds of thouſands*, wherein any Figure ſignifieth a hundred thouſand times its own ſingle Value; the ſeventh is the Place of *Millions*, wherein any Figure ſignifieth a million of times its own ſingle Value; the eighth is the Place of *Ten millions*, wherein any Figure ſignifieth ten million of times its own ſingle Value; the ninth or laſt Place is the Place of *Hundreds of millions*, wherein any Figure ſignifieth an hundred of millions of times its own ſingle Value.

And ſo you may expreſs the firſt Line of Figures in the following Table:

One Hundred Twenty Three Million, Four Hundred Fifty Six Thouſand, Seven Hundred Eighty Nine.

The Line of Six's you may read thus:

Six Hundred Sixty Six Million, Six Hundred Sixty Six Thouſand, Six Hundred Sixty Six.

Suppoſe you ask the Queſtion, What's Five in the Fifth Place by annexing Four Cyphers towards the Right Hand of the Five, thus 50000? It is *Fifty Thouſand*. Obſerve the Table.

Numeration Table.

Left Hand

Hundreds of Millions	1	1 2 3 4 5 6 7 8 9	9	*Ninth Place*
Tens of Millions	2	1 2 3 4 5 6 7 8 9	8 9	*Eighth Place*
Millions	3	1 2 3 4 5 6 7 8 9	7 8 9	*Seventh Place*
Hundreds of Thouſands	4	1 2 3 4 5 6 7 8 9	6 7 8 9	*Sixth Place*
Tens of Thouſands	5	1 2 3 4 5 6 7 8 9	5 6 7 8 9	*Fifth Place*
Thouſands	6	1 2 3 4 5 6 7 8 9	4 5 6 7 8 9	*Fourth Place*
Hundreds	7	1 2 3 4 5 6 7 8 9	3 4 5 6 7 8 9	*Third Place*
Tens	8	1 2 3 4 5 6 7 8 9	2 3 4 5 6 7 8 9	*Second Place*
Units	9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	*Firſt Place*

Right Hand

Note, Although I have made the Table to conſiſt but of nine Places, yet it may conſiſt of as many Places as you pleaſe, obſerving that the Value of every Place is ten times as much as that which goeth before it: So the Tenth Place is *Thouſands of Millions*, the Eleventh Place is *Tens of Thouſands of Millions*, the Twelfth Place is *Hundreds of Thouſands of Millions*, the Thirteenth Place is *Millions of Millions*, the Fourteenth Place is *Ten Millions of Millions*, the Fifteenth Place is *Hundred Million of Millions*, &c.

So that Fifteen Figures may be read as followeth, *viz.*

Hundred Million of Millions	*Ten Million of Millions*	*Million of Millions*	*Hundred Thouſand of Millions*	*Ten Thouſand of Millions*	*Thouſand Millions*	*Hundreds of Millions*	*Tens of Millions*	*Millions*	*Hundreds of Thouſands*	*Tens of Thouſands*	*Thouſands*	*Hundreds*	*Tens*	*Units*
5	4	6	8	7	9	6	4	3	2	0	7	8	5	4

Five Hundred Forty Six Million of Millions, Eight Hundred Seventy Nine Thouſand Six Hundred Forty Three Millions, Two Hundred Seven Thouſand, Eight Hundred Fifty Four.

By the Help of the foregoing Table, and the Directions already given, you may expreſs, value, or write down any Number.

CHAP. II.

Addition of Money, Weight and Meaſure, with their ſeveral Tables.

ADDITION teacheth you to add Two or more Sums together, to make them one total Sum.

Note,	4	*Farthings*	is	1	*Penny*
	12	*Pence*		1	*Shilling*
	20	*Shillings*		1	*Pound*

Before you proceed theſe following Tables ought to be learned very well by heart.

s.		*d.*
1	is	12
2		24
3		36
4		48
5		60
6		72
7		84
8		96
9		108
10		120
11		132
12		144

d.		*s.*	*d.*
20	is	1	8
30		2	6
40		3,	4
50		4	2
60		5	0
70		5	10
80		6	8
90		7	6
100		8	4
110		9	2
120		10	0

ADDITION teacheth to gather divers Numbers into one Sum: for the underſtanding whereof always obſerve to place the Numbers or Sums of the like Degree one under another; that is, place *Units* under *Units*, *Tens* under *Tens*, *Hundreds* under *Hundreds*, *Thouſands* under *Thouſands*, *Ten Thouſands* under *Ten Thouſands*, *Hundreds of Thouſands* under *Hundreds of Thouſands*, *Millions* under *Millions*, &c.

If the Numbers given to be added are of one Name, then rank them orderly as in the Example following.

A Merchant is indebted, *viz.*

		l.
To	*A* —	4893
	B —	6874
	C —	9876
	D —	5746
	E —	4576

Then beginning at the Right Hand add up the firſt Rank, ſaying, 6 and 6 is 12, and 6 is 18, and 4 is 22, and 3 is 25, ſet down all above Ten or Tens, *viz.* 5, under the Line, and carry 2 to the next Line, ſaying, 2 and 7 is 9, and 4 is 13, and 7 is 20, and 7 is 27, and 9 is 36; ſet down 6 and carry 3 to the next Line, ſaying, 3 and 5 is 8, and 7 is 15, and 8 is 23, and 8 is 31, and 8 is 39; ſet down 9 and carry 3 to the next Line, ſaying, 3 and 4 is 7, and 5 is 12, and 9 is 21, and 6 is 27, and 4 is 31; which ſet down, there being no more Ranks. The Total Sum is Thirty one thouſand nine hundred ſixty five Pounds, as by the following Work appeareth, *viz.*

l. 489

	l.
	4893
	6874
	9876
	5746
	4576
Total	31965

If the Numbers to be added are of divers Names, as *Pounds*, *Shillings*, *Pence* and *Farthings*, then write them down ſo as Numbers of one Name may ſtand orderly under one another, and ſet the leaſt Name next the Right Hand: but I would deſire you to mind in all Additions and Subſtractions the Title of your Account, as

l. ſtands for *Pounds*
s. ſtands for *Shillings*
d. ſtands for *Pence*

And when you would ſet down *Three Farthings*, a *Half-penny*, or a *Farthing*, write them thus,

$\frac{3}{4}$ *Three Farthings*
$\frac{1}{2}$ *A Half-penny*
$\frac{1}{4}$ *A Farthing*

as in the following Example.

A Man is indebted to the following Perſons, *viz.*

		l.	s.	d.	
To	*A*	—476	16	11	$\frac{1}{2}$
	B	—594	17	10	$\frac{3}{4}$
	C	—687	19	11	$\frac{1}{4}$
	D	—367	16	10	$\frac{1}{2}$
	E	—498	18	11	$\frac{3}{4}$

Then mind the Title of your Account, and ſee how many of the leſſer Names makes one of the next greater; then begin with the leaſt Name and add them together, ſaying, $\frac{3}{4}$ and $\frac{1}{2}$ is 5, and $\frac{1}{4}$ is 6, and $\frac{3}{4}$ is 9, and $\frac{1}{2}$ is 11 Farthings, which is 2 Pence 3 Farthings, which 3 Farthings I ſet down under the Line, and under the Name of Farthings, and carry 2 Pence to the next Name of Pence, ſaying, 2 that I carry and 11 is 13, and 10 is 23, and 11 is 34, and 10 is 44, and 11 is 55; now 55 Pence is 4 Shillings and 7 Pence, which 7 Pence I ſet under the Line, and carry 4 Shillings to the Name of Shillings, ſaying, 4 that I carry and 18 is 22, and 16 is 38, and 19 is 57, and 17 is 74, and 16 is 90 Shillings; which is 4 Pound 10 Shillings, which 10 Shillings I ſet under the Line and under the Name of Shillings, and carry 4 Pound to the Name of Pound, ſaying, 4 that I carry and 8 is 12, and 7 is 19, and 7 is 26, and 4 is 30, and 6 is 36; which 6 I ſet down under the Line, and carry 3 to the next, ſaying, 3 that I carry and 9 is 12, and 6 is 18, and 8 is 26, and 9 is 35, and 7 is 42; which 2 I ſet under the Line, and carry 4 to the next, ſaying 4 that I carry and 4 is 8, and 3 is 11, and 6 is 17, and 5 is 22, and 4 is 26; which I put under the Line: The whole Work is finiſh'd, and I find the Sum of the given Numbers to be, Two thouſand ſix hundred twenty ſix Pound Ten Shillings and Seven Pence Three Farthings, as by the following Work appeareth, *viz.*

	l.	*s.*	*d.*	
	476	16	11	$\frac{1}{2}$
	594	17	10	$\frac{3}{4}$
	687	19	11	$\frac{1}{4}$
	367	16	10	$\frac{1}{2}$
	498	18	11	$\frac{3}{4}$
Total	2626	10	07	$\frac{3}{4}$

To Prove Addition.

Cut off with your Pen the firſt Line in your Addition, then add up all the other Lines again : *Laſtly*, to the laſt Sum add the Line cut off, and if the Sum be equal to the Sum firſt added up, the Work is right ; but if unequal, the Work is falſe.

EXAMPLES.

l.	*s.*	*d.*	*l.*	*s.*	*d.*
476	16	11 ½	784	18	10 ¾
594	17	10 ¾	669	19	11 ½
687	19	11 ¼	476	18	10 ¼
367	16	10 ½	768	19	11 ½
498	18	11 ¾	468	16	10 ¼
2626	10	07 ¾	3169	14	06 ¼
2149	13	08 ¼	2384	15	07 ½
2626	10	07 ¾	3169	14	06 ¼

Averdupoize Weight.

Note that	16 *Drams*	is	1 *Ounce*
	16 *Ounces*		1 *Pound*
	28 *Pound*		1 *Quarter of* 112 ℔
	4 *Quarters*		1 *Hundred Weight.*
	20 *Hundred*		1 *Tun*

In a *Tun* are	573440 *Drams*
	35840 *Ounces*
	2240 *Pounds*
	80 *Quarters*
	20 *Hundred Weight of* 112 ℔ *each.*

Note that the Marks

For	is
Tuns	*T.*
Hundreds	C.
Quarters	*Qr.*
Pounds	lb.
Ounces	Oz.
Drams	*dr.*

EXAMPLES.

T.	C.	*Qr.*	lb	*oz.*	*dr.*	*T.*	C.	*Qr.*	lb	*oz.*	*dr.*
84	10	1	16	14	10	46	14	3	16	11	10
96	17	3	18	15	11	84	19	2	24	14	15
17	18	2	13	11	10	69	16	3	18	10	11
68	16	3	17	13	14	49	15	2	19	11	11
76	19	2	18	11	10	68	14	1	17	10	08
345	03	2	02	03	07	320	01	2	13	11	07
260	13	0	13	04	13	273	06	2	24	15	13
345	03	2	02	03	07	320	01	2	13	11	07

Troy Weight.

Note that

	is
24 *Grains*	1 *Penny-weight*
20 *Penny-weight*	1 *Ounce*
12 *Ounces*	1 *Pound*

In a *Pound Troy* are
5760 *Grains*
240 *Penny-weight*
12 *Ounces*

Note that the Marks

For	is
Pounds	lb
Ounces	*oz.*
Penny-weights	*pw.*
Grains	*gr.*

lb

lb	*oz.*	*pw.*	*gr.*	lb	*oz.*	*pw.*	*gr.*
78	11	14	16	87	11	16	17
59	10	19	11	48	10	17	18
68	11	17	11	58	11	18	17
46	10	16	17	49	10	16	10
254	09	08	07	245	09	09	14
175	09	13	15	157	09	12	21
254	09	08	07	245	09	09	14

Cloth Meaſure.

Note that 4 *Nails* is 1 *Quarter.*

4	*Quarters* is	1 *Yard*
3		1 *Ell Flemiſh*
5		1 *Ell Engliſh.*

20	*Nails* is	1 *Ell Engliſh*
16		1 *Yard*
12		1 *Ell Flemiſh*

Note that the Marks for		is
	Yards	*yds.*
	Quarters	*qrs.*
	Nails	*na.*
	Ells Flemiſh	*El.fl.*
	Ells Engliſh	*Ells.*

EXAMPLES.

Ells	*qrs*	*na*	*yds*	*qrs*	*na*	*El.fl.*	*qrs*	*na*
58	1	2	46	2	3	68	2	3
47	2	3	58	3	2	49	1	2
67	4	2	78	2	3	68	2	3
57	3	3	58	3	1	49	2	1
231	2	2	243	0	1	237	0	1
173	1	0	196	1	2	168	0	2
231	2	2	243	0	1	237	0	1

Wine Meaſure.

Note that	2 *Pints*	is	1 *Quart*
	2 *Quarts*		1 *Pottle*
	2 *Pottles*		1 *Gallon*
	42 *Gallons*		1 *Tierce*
	1 *Tierce* ½		1 *Hogſhead*
	63 *Gallons*		1 *Hogſhead*
	2 *Hogſheads*		1 *Pipe* or *Butt*
	2 *Pipes*		1 *Tun*

In a *Tun* are	2016 *Pints*
	1008 *Quarts*
	504 *Pottles*
	252 *Gallons*
	6 *Tierce*
	4 *Hogſheads*
	2 *Pipes*

Note that Honey and Oil are meaſured by this Meaſure.

EXAMPLES.

Tuns.	*hogs.*	*gals.*	*pot.*	*qts.*	*pts.*
47	3	18	1	0	1
86	0	19	0	1	1
58	3	27	1	1	1
49	2	48	1	0	0
68	1	11	1	1	1
310	3	00	0	1	0
262	3	44	1	0	1
310	3	00	0	1	0

Tuns.	*hogs.*	*gals.*	*pot.*	*qts.*	*pts*
84	2	16	0	1	1
56	3	17	1	1	0
68	2	19	0	1	1
47	3	18	1	1	1
49	2	17	1	0	0
307	1	26	1	1	1
222	3	10	1	0	0
307	1	26	1	1	1

Beer Meaſure.

Note that	2 *Pints*	is	1 *Quart*
	2 *Quarts*		1 *Pottle*
	2 *Pottles*, or 282 *ſolid Inches*,		1 *Gallon*
	9 *Gallons*		1 *Firkin*
	2 *Firkins*		1 *Kilderkin*
	2 *Kilderkins*		1 *Barrel*

In a *Barrel* are	288	*Pints*
	144	*Quarts*
	72	*Pottles*
	36	*Gallons*, or
	10152	*ſolid Inches*
	4	*Firkins*
	2	*Kilderkins.*

Ale Meaſure.

Note that	2 *Points*	is	1 *Quart*
	2 *Quarts*		1 *Pottle*
	2 *Pottles* or 282 *ſolid Inches*		1 *Gallon*
	8 *Gallons* of *Ale, Herring* or *Soap*		1 *Firkin*
	2 *Firkins*		1 *Kilderkin*
	2 *Kilderkins*		1 *Barrel.*

In a Barrel are	256	*Pints*
	128	*Quarts*
	64	*Pottles*
	32	*Gallons* or
	9024	*Solid Inches*
	4	*Firkins*
	2	*Kilderkins.*

Sheep's-Wool Weight.

Note that	7 *Pound*	is	1 *Clove*
	2 *Cloves*		1 *Stone*
	2 *Stone*		1 *Tod*
	6 *Tod* ½		1 *Wey*
	2 *Weys*		1 *Sack*
	12 *Sacks*		1 *Laſt.*

In a Laſt of Wool are	4368 *Pounds*
	624 *Cloves*
	312 *Stone*
	156 *Tod*
	24 *Weys*
	12 *Sacks.*

Of Dozens.

Note that	12 *Pieces* or *Things*	is	1 *Dozen*
	12 *Dozen*		1 *Small Groſs*
	12 *Small Groſs*		1 *Great Groſs.*

In a *Great Groſs* are	1728 *Pieces* or *Things*
	144 *Dozen*
	12 *Small Groſs.*

Square Meaſure.

	16 *Quarters* of an *Inch*		1 *Inch*
Note that	144 *Inches*	is	1 *Foot*
	9 *Foot*		1 *Yard*
	30 *Yards* ½		1 *Pole*
	40 *Pole* long and 1 broad		1 *Rood*
	4 *Roods*		1 *Acre*
	640 *Acres*		1 *Mile.*

In a *Square Mile* are	4014489600 *Inches*
	27878400 *Feet*
	3097600 *Yards*
	102400 *Poles*
	2560 *Roods*
	640 *Acres.*

Apothecaries Weights.

Note that	20 *Grains*	is	1 *Scruple*
	3 *Scruples*		1 *Dram*
	8 *Drams*		1 *Ounce*
	12 *Ounces*		1 *Pound*

In a *Pound* are	5760 *Grains*
	288 *Scruples*
	96 *Drams*
	12 *Ounces*

Note that the Marks

For	*Pounds*	is	lb
	Ounces		℥
	Drams		ʒ
	Scruples		℈
	Grains		*gr.*

EXAMPLES.

lb	℥	ʒ	℈	*gr.*		lb	℥	ʒ	℈	*gr.*
78	11	6	2	18		54	10	5	1	12
46	10	5	1	17		69	11	6	2	16
68	11	4	2	16		87	10	3	2	19
49	10	3	1	17		46	11	6	1	16
244	08	5	0	08		259	08	7	0	03
165	08	6	0	10		204	10	1	1	11
244	08	5	0	08		259	08	7	0	03

Land

Land Meaſure.

Note that	3	*Barley Corns*	is	1	*Inch*
	12	*Inches*		1	*Foot*
	3	*Foot*		1	*Yard*
	2	*Yards*		1	*Fathom*
	5	*Yards* ½		1	*Pole* or *Perch*
	40	*Poles*		1	*Furlong*
	8	*Furlongs*		1	*Engliſh Mile*

In a *Mile* are	190080	*Barley Corns*
	63360	*Inches*
	5280	*Feet*
	1760	*Yards*
	320	*Poles*
	8	*Furlongs*

EXAMPLES.

Miles	*Fur.*	*Pol.*	*Yds*	*Feet*	*Inc.*	*Miles*	*Fur.*	*Pol.*
568	7	17	746	2	11	687	0	28
869	6	16	589	1	06	596	5	16
768	5	34	764	2	10	689	6	17
496	4	19	879	1	11	768	5	19
2704	0	06	2981	0	02	2742	2	00
2135	0	29	2234	0	03	2055	1	12
2704	0	06	2981	0	02	2742	2	00

Dry Meaſure.

Note that

2 *Points*	is	1 *Quart*
2 *Quarts*		1 *Pottle*
2 *Pottles*		1 *Gallon*
2 *Gallons*		1 *Peck*
4 *Pecks*		1 *Buſhel* of *Corn Meaſure*
5 *Pecks*		1 *Buſhel* of *Water Meaſ.*
8 *Buſhels*		1 *Quarter*
4 *Quarters*		1 *Chaldron*
5 *Quarters*		1 *Wey*
2 *Weys*		1 *Laſt*

Note that 36 *Buſhels* is a *Chaldron* of *Sea Coal.*

In a *Laſt* are

5120	*Pints*
2560	*Quarts*
1280	*Pottles*
640	*Gallons*
320	*Pecks*
80	*Buſhels*
10	*Quarters*
2	*Weys.*

EXAMPLES.

Chald.	*Qrs.*	*Buſh.*	*Pec.*	*Gal.*
548	3	7	3	1
497	2	6	2	0
587	3	5	3	1
498	1	7	2	1
2133	0	3	3	1
1584	0	4	0	0
2133	0	3	3	1

Chald.	*Qrs.*	*Buſh.*	*Pec.*	*Gal.*
687	2	6	1	1
498	3	7	0	0
694	1	5	1	1
786	3	7	0	0
2668	0	1	3	0
1980	1	3	1	1
2668	0	1	3	0

TIME.

TIME.

Note that	60 *Seconds*	is	1 *Minute*
	60 *Minutes*		1 *Hour*
	24 *Hours*		1 *Day*
	7 *Days*		1 *Week*
	4 *Weeks*		1 *Month*
	13 *Months*, 1 *Day*, 6 *Hours*		1 *Year.*

In a *Year* are	31557600	*Seconds*
	525960	*Minutes*
	8766	*Hours*
	365	*Days* and 6 *Hours.*

EXAMPLES.

Years	*Mon.*	*Wee.*	*Day.*	*Hou.*	*Min.*
148	10	2	5	16	22
487	11	3	4	19	48
768	12	1	6	14	11
476	11	2	3	11	16
1882	07	2	6	13	37
1733	10	0	0	21	15
1882	07	2	6	13	37

Years	*Mo.*	*We.*	*Da.*	*Ho.*	*Mi.*
479	10	1	5	14	16
687	11	3	6	19	22
476	11	2	4	18	23
569	10	1	3	16	14
2214	05	1	6	20	15
1734	08	0	1	05	59
2214	05	1	6	20	15

And thus you may add Numbers of any Names or Denominations.

CHAP. III.

Subſtraction of MONEY, WEIGHT, MEASURE, &c.

SUBSTRACTION teacheth to take one Number out of another, ſo that the Remainder or Difference may be known.

If the Numbers given be of one Name, then write down firſt the Greater, and under it the Leſſer.

EXAMPLE.

A. lent to *B.* 6457 *l.* *B.* has paid *A.* 5769 *l.* how much remains for *B.* to pay.

	l.
Lent	6457
Paid	5769

Begin at the Right Hand, ſubſtract the firſt Figure of the leſſer Number out of the firſt Figure of the greater Number, and write down the Remainder or Difference directly under them; as 9 from 7 I cannot, therefore I borrow 10 and add it to the 7, and it makes 17, and ſay 9 from 17 and there remains 8, which I ſet under the Line; I carry 1 to the next Figure becauſe I borrowed 10, ſaying, 1 that I borrowed and 6 is 7, ſaying, 7 from 5 I cannot, but 7 from 15 and there remains 8, which I put under the Line; and ſay, 1 that I borrowed and

7 is 8, ſaying, 8 from 4 I cannnot, but 8 from 14 and there remains 6, which I put under the Line; then ſay, 1 that 1 borrowed and 5 is 6, ſaying, 6 from 6 and there remains 0.

	l.
Lent	6457
Paid	5769
Remains unpaid	688

So that there remains for *B* to pay 688 *Pounds.*

If any Figure of the lower Number be greater than the Figure of the upper Number that ſtands over it, you muſt increaſe the leſſer Figure by 10, and then ſubſtract as before; and for the 10 borrowed, you muſt add 1 to the following Figure of the lower Number, as is taught in the foregoing Example.

A Merchant has owing to him 4687 *l.* 10 *s.* 9 *d.* $\frac{3}{4}$ whereof there is paid 1598 *l.* 12. *s.* 6 *d.* $\frac{1}{4}$ how much remains unpaid.

Rank the Numbers as in *Addition*, and begin with the Numbers of the leaſt Name, ſubſtract the lower from the upper Number, and ſet down the Remainder as is before taught.

EXAMPLE.

	l.	*s.*	*d.*
Lent	4687	10	9 $\frac{3}{4}$
Paid	1598	12	6 $\frac{1}{4}$

Firſt I ſay, $\frac{1}{4}$ *Farthing* from $\frac{3}{4}$ *Farthings* and there remains 2 *Farthings* ; then I ſay, 6 *Pence* from 9 *Pence* and there remains 3 *Pence*, which I put under the Line ; then I ſay, 12 *Shillings* from 10 *Shillings* I cannot, but 12 *Shillings* from 20 *Shillings* and there remains 8 *Shillings*, which I add to the 10 *Shillings* makes 18 *Shillings*, which I put under the Line and carry 1 to *Pounds*, ſaying, 1 and 8 is 9 from 7 I cannot, but 9 from 17 and there remains 8, which I put under the Line and carry 1, ſaying, 1 and 9 is 10 from 18 and there remains 8, which I put under the Line and carry 1 to 5, ſaying, 1 and 5 is 6, from 6 and there remains 0, which I put under the Line and then proceed to the next Figure, ſaying, 1 from 4 and there remaies 3, which I put under the Line ; and find that there remains unpaid, Three thouſand eighty-eight *Pounds*, Eighteen *Shillings*, Three *Pence Half-penny*. See the Work.

	l.	*s.*	*d.*
Lent	4687	10	09 $\frac{3}{4}$
Paid	1598	12	06 $\frac{1}{4}$
Remains unpaid	3088	18	03 $\frac{1}{2}$
Proof	4687	10	09 $\frac{3}{4}$

l.	*s.*	*d.*
6847	17	10 $\frac{1}{2}$
4987	18	11 $\frac{3}{4}$
1859	18	10 $\frac{3}{4}$
6847	17	10 $\frac{1}{2}$

l.	*s.*	*d.*
4968	18	11 $\frac{1}{4}$
3908	16	11 $\frac{1}{2}$
1060	01	11 $\frac{3}{4}$
4968	18	11 $\frac{1}{4}$

If a Man lends a Sum of Money, and he receives divers Payments in Part, and you would know how much remains due; you muſt add the ſeveral Payments into one Sum, and ſubſtract that Sum from the Sum lent, and the Remainder will ſhew how much is due.

EXAMPLES.

	l.	s.	d.	l.	s.	d.
Lent	7846	16	11 ¼	7943	10	00 ¼
Paid at ſeveral Times.	689	19	10 ¼	579	19	11 ½
	4576	16	11 ¾	3698	18	10 ¾
	38	16	10 ¼	769	19	11 ½
	598	18	11 ¾	178	16	10 ¾
	1649	19	10 ½	987	17	11 ½
Paid in all	7554	12	06 ½	6215	13	08
Remains unpaid	292	04	04 ¾	1727	16	04 ¼
Proof	7846	16	11 ¼	7943	10	00 ¼

The Proof of *Subſtraction.* Add the Remainder to the Sum ſubſtracted, and if it make the ſame Sum with that from which you did ſubſtract, it is right, if not, it is falſe; as in the laſt Example.

	l.	s.	d.
Add the Sum ſubſtracted	7554	12	06 ½
to the Remainder	292	04	04 ¾
Proof	7846	16	11 ¼

Averdupoize Weight.

For the Underſtanding of which you muſt obſerve (as you did before) the Title of your Account.

EXAMPLE.

A *Grocer* buys 74 *C.* ½ *qrs.* 16 lb. of Sugar, of which he ſold 38 *C.* ¾ *qrs.* 19 lb. how much remains unſold. Place this Number thus :

	C.	*qrs.*	lb.
Bought	74	½	16
Sold	38	¾	19

Begin at the Right Hand, ſaying, 19 from 16 I cannot, but 19 from 28 and there remains 9, which I add to the 16 makes 25, which I put under the Line ; then I ſay, 1 that I carry and 3 is 4, that is, 0 from 2 and there remains 2, which I put under the Line and carry 1 to *Hundreds* ; ſaying 1 that I carry and 8 is 9 from 4 I cannot, but 9 from 14 and there remains 5, which I put under the Line and carry 1 ; ſaying, 1 that I carry and 3 is 4, from 7 and there remains 3, which I put under the Line. I find there remain unſold, *Thirty-five Hundred* Weight, *Two Quarters and Twenty-five Pound.* See the Work.

Bought

	C.	*qrs.*	lb.
Bought	74	2	16
Sold	38	3	19
Remains unſold	35	2	25
Proof	74	2	16

	Tun.	C	*qrs.*	lb.	*oz.*	*T.*	C.	*qrs.*	lb.	*oz.*	*dr.*
Bought	54	11	1	16	14	58	18	2	16	10	14
Sold	37	17	2	19	15	49	19	3	17	10	15
Reſt	16	13	2	24	15	08	18	2	26	15	15
Proof	54	11	1	16	14	58	18	2	16	10	14

	T.	C.	*qrs.*	lb.	*oz.*	*dr.*
Bought	7946	18	1	11	10	14
Sold at ſeveral Times	376	19	2	18	11	15
	1987	16	3	19	10	10
	498	18	1	17	11	15
	36	19	3	18	15	14
	2798	18	2	16	14	15
Sold in all	5699	13	2	08	01	05
Remains unſold	2247	04	3	03	09	09
Proof	7946	18	1	11	10	14

Troy

Troy Weight.

	lb	oz.	pw.	gr.	lb	oz.	pw.	gr.
Bought	878	06	14	11	5894	11	16	22
Sold	498	10	16	15	4989	10	19	23
Remains	379	07	17	20	0905	00	16	23
Proof	878	06	14	11	5894	11	16	22

Cloth Meaſure.

	Yds	qr.	na.	Ell.fl.	qr.	na.	Ells.	qr.	na.
Bought	547	0	0	583	1	2	3758	1	2
Sold	498	2	2	498	2	3	2569	2	3
Remains	048	1	2	084	1	3	1188	3	3
Proof	547	0	0	583	1	2	3758	1	2

CHAP. IV.

MULTIPLICATION.

MULTIPLICATION teacheth by Two given Numbers to find a Third, which will contain either of the given Numbers ſo often as the other contains One or an Unit.

The Greater of the given Numbers is called the *Multiplicand*, and the Leſſer is the *Multiplier*.

The Third Number ſought or ariſing by the Multiplication of the other Two, is called the *Product*.

But before you proceed any farther, it is very neceſſary that the Learner get the following Table very well by Heart.

Multiplication Table.

2 times.	2 is	4
	3	6
	4	8
	5	10
	6	12
	7	14
	8	16
	9	18
	10	20
	11	22
	12	24

3 times.	3 is	9
	4	12
	5	15
	6	18
	7	21
	8	24
	9	27
	10	30
	11	33
	12	36

4 times	4 is	16
	5	20
	6	24
	7	28
	8	32
	9	36
	10	40
	11	44
	12	48

5 times	5 is	25
	6	30
	7	35
	8	40
	9	45
	10	50
	11	55
	12	60

6 times	6 is	36
	7	42
	8	48
	9	54
	10	60
	11	66
	12	72

7 times	7 is	49
	8	56
	9	63
	10	70
	11	77
	12	84

8 times	8 is	64
	9	72
	10	80
	11	88
	12	96

9 times	9 is	81
	10	90
	11	99
	12	108

10 times	10 is	100
	11	110
	12	120

11 tim.	11 is	121
	12	132

12 tim.	12 is	144

When the *Multiplicand* conſiſts of more Figures than one, and the *Multiplier* is a ſingle Figure, 574 multiplied by 3, then write them down orderly; as in the Example following; *viz.*

Multiplicand	574
Multiplier	3
Product	

Multiply every Figure of the *Multiplicand* by the *Multiplier*, ſetting down all under or above Ten or Tens, and for every Ten carry 1 to the next Place, (as is taught in Addition) till you come to the laſt Place, where you ſet all down. Thus 3 times 4 is 12, I ſet down 2 and carry 1; then ſay, 3 times 7 is 21, and 1 that I carry is 22, I ſet down 2 and carry 2; then ſay 3 times 5 is 15, and 2 that I carry is 17, which I ſet down, and find the *Product* to be *One Thouſand Seven Hundred Twenty-two.* See the Work.

Multiplicand	574
Multiplier	3
Product	1722

Which is the ſame as if I had added 3 times 574 together, thus,

$$\begin{array}{r} 574 \\ 574 \\ 574 \\ \hline 1722 \end{array}$$

When the *Multiplicand* and *Multiplier* conſiſts of 2, 3, 4, or more Figures, place them orderly under one another, as in the Example following; *viz.*

5876 to be multiplied by 243, what's the *Product.*

5876
243

17628
23504
11752

1427868

Multiply every Figure of the *Multiplicand* by 3 the firſt *Multiplier*, and then every Figure of the *Multiplicand* by 4 the ſecond *Multiplier*, and then every Figure of the *Multiplicand* by 2 the third *Multiplier*; then draw a Line, and add them up together as in Addition, and you find the *Product* to be *One Million Four Hundred Twenty-ſeven Thouſand Eight Hundred Sixty eight.*

Note, That in whatſoever Place the Figure of the *Multiplier* (whether a Cypher or Cyphers) ſtands from the Place of Units, in the ſame Place muſt the firſt Figure of that *Multiplication* be ſet from the Unit of the *Multiplicand*; as you may obſerve in the foregoing Example, and the Example following:

57694 to be multiplied by 25060 what's the *Product.*

57694
25060

3461640
2884700
115388

1445811640

The Proof of *Multiplication* by the Croſs.

7
4-|-4
7

Firſt I add all the Figures of the *Multiplicand* together, and caſt all the Nines out, and ſet the *Remainder* on the left Side of the Croſs, which I find to be 4; then I caſt all the Nines out of the *Multipliers*, and place the *Remainder* on the right Side of the Croſs, which I find to be 4; then I multiply the Two *Remainders* one by another, and find the *Product* to be 16; then I caſt all the Nines out of 16, and I find the *Remainder* to be 7, which I place on the Top of the Croſs; and Laſtly, I caſt all the Nines out of the *Product*, and I find the *Remainder* to be 7, which I place at the Bottom of the Croſs; then look and ſee, if the Figure above the Croſs and the Figure below the Croſs be alike, the Work is right; if not it's falſe. Though this is the common Way of proving *Multiplication*, yet its ſureſt Proof is by *Diviſion*.

EXAMPLES.

78469 to be multiplied by 487, what's the *Product*?
Anſwer, 38214403

98647 to be multiplied by 3794, what's the *Product*?
Anſwer, 374266718

687946 to be multiplied by 47658, what's the *Product*?
Anſwer, 32786130468

87698768 to be multiplied by 376854, what's the *Product*?
Anſwer, 33049631515872

8746 lb of *Tobacco* at 36 *Pence per* lb. what comes the Quantity to.

8746
36 *d.*

52476
26238

314856 *Pence* or

8746
3 *s.*

26238 *Shillings.*

Another Example.

Suppoſe,

One Hundred Fires was made on the Elæzian *Shore,*
One Thouſand Spits was plac'd, each Fire before.
Three Hundred Chines of Beef. was fixt on every Spit,
And Twice Three Hundred Greeks, *to every Bit.*

I demand how many *Chines* of *Beef* there were in all, and how many *Men* there were to eat up that Meat. See the Work.

100 Fires
1000 Spits

100000 Spits
300 Chines on one Spit

30000000 Chines of Beef
600 Men to one Chine

18000000000 Men to all the Chines.

So that I find by the Work, That there was *Eighteen Thouſand Million* of *Men* to eat up the *Thirty Million* of *Chines.*

By this Method you may multiply any Two Numbers you propoſe.

CHAP.

CHAP. V.

Diviſion explained with Variety of Queſtions for the Learner's Practice.

DIVISION teacheth you to find how often one Number is contained in another. In which you muſt obſerve,

1ſt, The Number given to be divided is called the *Dividend.*

2*dly*, The Number by which it is to be divided is called the *Diviſor.*

3*dly*, The Number ariſing from the *Diviſion* is called the *Quotient*, becauſe it ſignifies how often the the *Diviſor* is contained in the *Dividend.*

4*thly*, The *Remainder* is always leſs than the *Diviſor.*

Diviſion is the hardeſt Leſſon in *Arithmetick*, therefore particular Care muſt be taken in the working thereof, I ſhall endeavour to make it very plain and eaſy by the following Examples.

If 6874 *Pounds* were to be divided amongſt 8 Men, I would know each Man's Share ?

Draw Two crooked Lines, and place the Sum of Money or *Dividend* between, and 8 the Number of Men on the left Side of the *Dividend* for the *Diviſor.*

Diviſor		*Dividend*	*Quotient.*
8	)	6874	(

1*ſt*, See how often your *Diviſor* is contained in your *Dividend*, and ſet down the Number of Times in your *Quotient*.

2*dly*, Multiply the *Diviſor* by the Figure placed in the *Quotient*, and ſet the *Product* underneath the *Dividend*.

3*dly*, Draw a Line under the *Product*.

Laſtly, Subſtract that *Product* from the *Dividend*, and ſet the *Remainder* underneath the Line. Obſerve the Work; *viz.*

```
8) 6874 (8
```

I demand how many times the *Diviſor* 8 is in 6, I cannot, but in 68, the Anſwer is 8 times, which I place in the *Quotient*; then I multiply the *Diviſor* by the Figure in the *Quotient*, and the *Product* is 64, which I put underneath the *Dividend* 68, and draw a Line underneath the 64, and ſubſtract it from the *Dividend* 68, and ſet the *Remainder* under the Line and then the Work will ſtand thus,

```
8) 6874 (8
   64·
   ───
    47
```

Then I put a Point or Dot under the 7 in the *Dividend*, and bring it down under the Line, and ſet it after the *Remainder* 4, which is 47, a new *Dividend*; then I ask how many times the *Diviſor* 8 is found in 47, I find 5 times, which I place in the *Quotient*, then I multiply the *Diviſor* by 5 in the *Quotient*, the *Product* is 40, which I put under the *Dividend* 47, and draw a Line underneath the 40, and ſubſtract it from the *Dividend* 47, and ſet the *Remainder* under the Line, and then the Work will ſtand thus.

8)

```
8) 6874 (85
   64..
   ----
    47
    40
   ----
     7
     .
```

Then I put a Point under the 4 in the *Dividend*, and bring it down under the Line, and ſet it after the *Remainder* 7 which is 74, a new *Dividend*. Then I ask how many times 8 the *Diviſor* is found in 74, I find 9 times, which I place in the *Quotient*, then I multiply the *Diviſor* by 9 in the *Quotient*, and the *Product* is 72, which I put under the *Dividend* 74: and draw a Line underneath the *Product* 72, and ſubſtract it from the *Dividend* 74, and ſet the *Remainder* under the Line, and then the Work will ſtand thus.

```
8) 6874 (859
   64..
   ----
    47
    40
   ----
     74
     72
   ----
      2
   ----
```

The Work is finiſhed, the *Quotient* is found to be 859 *Pound*, for every Man's Share, but there remains 2 *Pounds* (which being multiplied by 20 *s.* and divid-by 8, every Man's Share will be 5 *Shillings*. So that

that I find every Man's Share to be *Eight Hundred Fifty-nine Pounds Five Shillings.*

Note, That if the firſt Figure of the *Dividend* towards the Left-Hand, be leſſer than the firſt Figure of the *Diviſor*, then you muſt try the *Diviſor* in the two firſt Figures towards the Left-Hand of the *Dividend*, as in the laſt Example.

To prove *Diviſion.*

Multiply your *Quotient* by your *Diviſor* or *Diviſors*, (and to the *Product* add your *Remainder* if any be) if it's right, the *Product* of the *Multiplication* will be equal to your *Dividend* ; if otherwiſe, your Work is falſe.

When the *Diviſor* conſiſts of more Figures than one, then you muſt ſet out as many Figures towards the Left-Hand of the *Dividend*, as there are Figures in the *Diviſor*, and put a Dot under that Figure of the *Dividend* which ſtands next the Right-Hand.

Then ſee how often the firſt Figure of the *Diviſor* is contained in the firſt Figure of the *Dividend*, and ſet the Anſwer in the *Quotient*.

Multiply the Figures of the *Diviſor* by the Figure in the *Quotient*, and ſet the *Product* in Order under the *Dividend*.

Then ſubſtract the ſaid *Product* from the *Dividend*, ſetting the *Remainder* under the Line.

Then put a Dot under the next Figure of the *Dividend*, and put it even with the *Remainder*, ſo you have a new *Dividend*, with which you are to proceed as is before taught.

EXAMPLE.

A Company of Boys, in Number 24, went into an Orchard and gathered 37680 Apples, and agreed they ſhould be equally ſhared amongſt them, I would know each Boy's Share ? *Diviſor*

```
Diviſor   Dividend   Quotient
  24   )   37680   (
```

I ask how many times 2 is in 3, is once, which I place in the *Quotient*; then I multiply the Figures in the *Diviſor* by the Figure in the *Quotient*, and ſet the *Product* under the two firſt Figures in the *Dividend*, draw a Line and ſubſtract the *Product* from the *Dividend*, and ſet the *Remainder* under the Line which is 13, then I put a Dot under the next Place in the *Dividend*, which is 6, and ſet it even with the *Remainder* 13, and it makes 136 a new *Dividend*, and then the Work will ſtand thus,

```
24) 37680 ( 1
    24·
    ----
    136
```

Then I ask how often I can have the firſt Figure of the *Diviſor* in 13, I find 5 times, which I put in the *Quotient*, and thereby multiply the *Diviſor*, and the *Product* is 12 , which I ſet under the *Dividend* 136, then draw a Line and ſubſtract as before, and ſet the *Remainder* under the Line, then I put a Dot under the next Place in the *Dividend*, which is 8, and ſet it even with the *Remainder* 16, and it makes 168 a new *Dividend*, and then the Work will ſtand thus,

```
24) 37680 ( 15
    24··
    -----
    136
    120
    -----
    168
```

Then I ask how often I can have the firſt Figure of the *Diviſor* in 16, I find 7 times, which I put in the *Quotient*, and thereby multiply the *Diviſor*, and the *Product* is 168, which I ſet under the *Dividend*, then draw a Line and ſubſtract as before, and then the Work will ſtand thus,

```
24 ) 37680 ( 1570
     24...
     -----
      136
      120
      -----
       168
       168
       -----
        00
```

Then I take down the 0, and put it under the Line, there being never another Figure, I put an 0 in the *Quotient*, and the work is finiſhed.

And I find each Boy's Share to be 1570 Apples.

Note, That when you have multiplied the *Diviſor* by the Figure in the *Quotient*, if the *Product* be greater than the *Dividend*, then you muſt cancel that and try one that is leſſer; and if the *Remainder* is greater, then the *Diviſor*, the Figure laſt placed in the *Quotient* is too little, therefore you muſt cancel that and put a bigger in its room.

EXAMPLE.

There is a Ship taken by 475 Seamen, which is valued at 74568 *Pounds*, to be equally divided amongſt them, I demand each Man's Share.

475) 74568 (156 *l.* each Man's Share.
475

2706
2375

3318
2850

468 *Pounds* remain.
20 *Shillings.*

475) 9360 (19 *s.* each Man's Share of the *Shillings.*
475

4610
4275

335 *Shillings.* remains.
12 *Pence.*

475) 4020 (8 *d.* each Man's Share of the *Pence.*
3800

220 *Pence* remains
4 *Farthings.*

475) 880 ($\frac{1}{4}$ each Man's Share of the *Farthings.*
475

405 *Farthings* remains.

So that I find each Man's Share to be 156 *l.* 19 *s.* 8 *d.* $\frac{1}{4}$ $\frac{405}{475}$ Part of a *Farthing.*

Note, That when a Sum of Money is to be divided amongſt a Number of Men, and if any Sum remains,

mains, every Perſon muſt have an equal Share thereof; if the *Remainder* is *Pounds,* multiply by 20, to bring them into *Shillings* ; if *Shillings,* by 12 to bring them into *Pence* ; if *Pence,* by 4 to bring them into *Farthings,* and divide every *Product* by the common *Diviſor,* and the *Quotient* will anſwer every Man's Share in *Shillings, Pence,* and *Farthings.* See the foregoing Example.

Queſtions for the Learner to practice.

There is a City taken in the Wars by 3655 Soldiers that was worth 87469576 *Pounds,* I demand each Soldier's Share of the *Pounds* ?

Anſwer, 23931 *l.* 9 *s.* 8 *d.* $\frac{1}{4}$ $\frac{585}{3655}$.

As for the *Remainders* of any *Diviſions,* I ſhall ſhew you what they are when you practice *Fractions.*

There are 4576 Soldiers to march 16 in one Rank or File, how many Files will they make ?

Anſwer, 286 Files.

There is a Tax of 1442100 *Pounds* to be equally raiſed by 57684 Pariſhes, I would know what each Pariſh muſt pay ?

Anſwer, 25 *l.*

There is 4698 Pounds of Powder to be employed in an Aſſault or Battery with 6 Pieces of Cannon, the Firſt Piece ſhooteth 4 Pounds, the Second 6 Pounds, the Third 8 Pounds, the Fourth 10 Pounds, the Fifth 12 Pounds, and the Sixth 14 Pounds, I demand how many Shoots each Piece may make, to make an equal Number of Shots ?

Anſwer, 87.

There was 5000 *Pence* given to be divided between 20 poor People, I deſire to know the Number of *Pence* each Perſon had ? Anſwer, 250.

A

A Horſe was cut into 400 Pieces to be diſtributed between 16 Dogs, how many Pieces had each Dog for his Share ?

Anſwer, 25.

A Shepherd driving 100 Sheep, in the Way met 10 plundering Soldiers, who demanded the Half of his Sheep to be equally divided amongſt them, now I would know how many Sheep each Soldier had for his Share ?

Anſwer, 5.

A Man Travelling fell among Thieves, (in Number 8) ſearching his Pockets, they found 8766 *Pence*, I demand each of their Shares, it being equally divided among them, they firſt giving him 350 *Pence* back to bear his Charges ?

Anſwer, 1052 *d.*

There was 6 Men digging a Field, and they found 87690 Crowns, they being all at the finding them conſented to ſhare the Money equally, I deſire to know each Man's Share?

Anſwer, 14615 *Crowns.*

Forty Dogs hunting a Stag, after the Sport was over the Stag was cut into 840 Pieces to be divided among the Dogs, how many Pieces had each Dog for his Share ?

Anſwer, 21 Pieces.

If 152 Hundred Weight coſt 760 *l.* what will 1 Hundred Weight coſt ?

Anſwer, 5 *l.*

A Woman gave 744 Oranges between 24 Girls, how many Oranges had each Girl for her Share ?

Anſwer 31 Oranges.

Twelve Merchants joined together and freighted out a Ship to Sea, when ſhe came Home her Cargo amounted to 987846048 Crowns, I demand each Merchants Share, they being equally concerned.

Anſwer, 82320504 Crowns.

CHAP.

CHAP. VI.

REDUCTION of Money, Weight, and Meaſure.

REDUCTION teacheth you to bring all Great Names into Small by *Multiplication*.

And all Small Names are brought into Great by *Diviſion*.

Note that	4	*Farthings*	is	1 *Penny*
	12	*Pence*		1 *Shilling*
	20	*Shillings*		1 *Pound*
	40	*Sixpences*		1 *Pound*
	60	*Groats*		1 *Pound*
	80	*Threepences*		1 *Pound*
	120	*Twopences*		1 *Pound*
	240	*Pence*		1 *Pound*
	480	*Halfpence*		1 *Pound*
	960	*Farthings*		1 *Pound*

The Names and Value of *Engliſh* Coins.

		s. d.		*Pence.*		*Farthings.*
A Guinea	is	21—6	or	258	or	1032
A Mark		13—4		160		640
A Piſtole		17—0		204		816
An Angel		10—0		120		480
A Noble		6—8		80		320
A Crown		5—0		60		240
A Dollar		3—4		40		160
A Half-Crown		2—6		30		120

In 746875898 *Farthings*, how many *Pence*, *Shillings*, and *Pounds*?

746875898 *Farthings.*
4 *Farthings*

186718974 $\frac{1}{2}$ *Pence.*
12 *Pence*

1555991|4 6 *Shillings.*
2 |0 *Shillings.*

777995 14 6 $\frac{1}{2}$
20

15559914
12

186718974
4

746875898 Proof.

l. *s.* *d.*
In 7654 16 11 ¼, how many *Shillings*, *Pence*, and *Farthings?*

l. *s.* *d.*
7654 16 11 ¼
20 *Shillings.*

153096 *Shillings.*
12 *Pence.*

1837163 *Pence.*
4 *Farthings.*

7348653 *Farthings.*
4

Proof 1837163 ¼
12

15309|6 11
2 |0

7654 16 11 ¼

A Merchant delivered 2000 *l.* to be exchanged for 13 *d.* $\frac{1}{2}$, 12 *d.* 9 *d.* 6 *d.* 4 *d.* $\frac{1}{2}$, 3 *d.* and *Twopences*, and of each a like Number, how many muſt he have of each Sort in exchange for the aforeſaid Sum ?

```
      l.                        d.
     2000                      13—½
       20                      12
    ——————                      9
    40000                       6
       12                       4—½
   ————————       Pieces        3
 50)480000(       9600          2
   450···           50        ————
  ———————       ———————        50
    300         480000
    300         12
   ——————       ———————
    000         4000|0
    000         2   |0
   ——————       ———————
     000        2000
     000        ———————
    ———————
      00
    ———————
```

	d.			l.
9600 *Pieces* of	13 $\frac{1}{2}$		each is	540
	12			480
	9			360
	6			240
	4 $\frac{1}{2}$			180
	3			120
	2			80
				2000

In 587647689 *Farthings*, how many *Pence*, *Groats*, *Dollars*, *Nobles*, and *Marks*?

In 468987698 *Farthings*, how many *Guineas?*
Anſwer, 454445 $\frac{458}{1032}$.

In 7458758 *Piſtoles*, how many *Shillings*, *Pence* and *Farthings?*

Anſwer, { 126798886 *Shillings.*
1521586632 *Pence.*
6086346528 *Farthings.*

WEIGHT.

IN 746874689 *Ounces*, how many *Pounds*, *Quarters*, *Hundreds* and *Tuns?*

```
                          lb           Qrs:
16) 746874689 (28) 46679668 (1667131
    64·······      28······    4
    ———            ———         ————  ————
     106            186         41678|2--3 Hundred.
      96            168         2    |0
     ———            ———        ————  ————C. qrs. lb. oz.
      108            187      Tuns 20839—2—3---0--1
       96            168           ——————  ——————
      ———            ———
       127            199
       112            196
       ———            ———
        154            36
        144            28
        ———            ———
         106           86
          96           84
         ———           ———
          108           28
           96           28
          ———           ———
           129          00
           128          ———
           ———
             1
           ———
```

Note, That whenever you find the Word (each) have a ſpecial Regard to it, and reduce the Particulars which it implieth into one Denomination, that when you know how much is contained in one, you may eaſily know how much is contained in all.

In 54678 C. ½ 17 lb. how many *Parcels* are contained in the ſame, each *Parcel* weighing 1 C. ½ 14 lb.

C. lb
54678 ½ 17
4 *Quarters.*

218714 *Quarters.*
28 *Pounds.*

1749719
437429

182) 6124009 (33648 *Parcels.*
546 . . . :

664
546

1180
1092

880
728

1529
1456

73 *Pounds* remaining.

C. lb
1 ½ 14
4 *Quarters:*

6 *Quarters.*
28 *Pounds.*

52
13

182 *Pounds in one Parcel.*

A

A Merchant bought 4 *Tun.* 14 *C.* ½ 17 lb. of Sugar, and ordered it to be made up into Parcels o 24 lb. of 20 lb. of 16 lb. of 12 lb. of 8 lb. of 4 lb. and of 2 lb. and of each a like Number, how ma many Parcels will be made of the Sugar.

Tuns	*C.*		lb.	lb.
4	14	½	17	24
20				20
				16
94				12
4				8
				4
378				2
28				
				86 lb. in all the *Parcels*
3031				
757				

86)10601(123 *Parcels* of each.
86
———
200
172
———
281
258
———
23
———

Parcels		lb		lb
123	of	24	each is	295
123	of	20	each is	2460
123	of	16	each is	1968
123	of	12	each is	1476
123	of	8	each is	984
123	of	4	each is	49
123	of	2	each is	246
				10578
				23
		Proof		10601

In 7465 *Tun.* 18 *C.* ¾ *qrs.* 16 lb. 10 *oz.* how many *Hundreds, Quarters, Pounds,* and *Ounces*?

In 7646876 C. $\frac{1}{2}$ 17 lb. how many Parcels are contained in the ſame of 50 lb. of 40 lb. of 30 lb. of 20 lb. of 16 lb. of 12 lb. of 8 l. of 4 lb. of 2 lb. and of each a like Number.

Troy Weight.

In 57468798 *Grains*, how many *Pennyweight*, *Ounces* and *Pounds*?

Grains *Grains* *Pennyweight.*

24) 57468798 (239453|3
48 . . . . . .

94
72

226
216

108
96

127
120

79
72

78
72

6

2 | 0 *Pennyweight.*

119726 13 *Ounces*
12 *Ounces.*

9977 2 13 6

Proof.

lb *oz.* *pw.* *gr.*
9977 2 13 6
12 *Ounces.*

119726 *Ounces.*
20 *Pennyweight.*

2394533 *Pennyweight.*
24 *Grains.*

9578138
4789066

57468798 *Grains.*

In 87469 lb. 11 *oz.* 10 *pw.* 22 *gra.* how many *Ounces*, *Pennyweights*, and *Grains*?

In 4698 Ingots, each weighing 2 lb. 10 *oz.* 11 *pw.* 17 *gr.* how many *Grains* in all?

TIME.

In 4768768798 *Minutes*, how many *Hours*, *Days*, *Weeks*, *Months*, and *Years*?

```
      476876879|8 Minutes.
       6       |0 Minutes.
      ---------------
Hours 79479479   58
  24) 72······ (3311644 Days.
      ----        7 Days.
       74      ----------
       72       473092 Weeks.
      ----      4 Weeks.
        27     ----------
        24      118273 Months.
       ----  13)117···(9097 Years.
        39      ----
        24      127
       ----     117
        154     ----
        144      103
       ----       91
         107     ----
          96      12
         ----    ----
          119
           96
         ----
           23
         ----
```

In the *Minutes* are found,

Years	*Mon.*	*We.*	*Da.*	*Hou.*	*Min.*
9097	12	0	0	23	58

In 546 *Years*, how many *Months*, *Weeks*, *Days*, *Hours*, and *Minutes* ?

How many *Minutes* is it ſince the Creation of the World, it being accounted 5657 *Years* ſince ?

Land Meaſure.

In 5468769876 *Barley-Corns*, how many *Inches*, *Feet*, and *Yards* ?

Barley-Corns.
5468769876
3 *Barley-Corns.*

1822923292 *Inches.*
12 *Inches.*

151910274 *Feet, and* 4 *Inches*
3 *Feet.*

50636758 *Yards.*
3

151910274 *Feet.*
12

1822923292 *Inches.*
3

5468769876 *Barley-Corns.*

In 7689 *Miles*, how many *Barley-Corns* ?

Anſwer, 1461525120 *Barley-Corns.*

In 175469 *Yards*, how many *Paces*, each 1 *Foot* ½.

Anſwer, 350938 *Paces.*

How many *Barley-Corns* will reach from *Loydon* to *Berwick*, it being accounted 250 *Miles* diſtant ?

Wine Meaſure.

In 74687469 *Pints*, how many *Quarts*, *Pottles Gallons*, *Hogſheads*, and *Tuns*?

Pints.
74687469
2 *Pints.*

37343734 *Quarts and* 1 *Pint.*
2 *Quarts.*

18671867 *Pottles.*
2 *Pottles.*

Gallons
63) 9335933 (1
63 .....

303
252

515
504

119
63

563
504

593
567

26

148189 *Hd.*
4 *Hogſh.*

37047-1

The Proof.

Tun. hd.gal.pot.qt.pt
37047-1-26-1-0-1
4 *Hogſheads.*

148189 *Hogſheads.*
63 *Gallons.*

444573
889136

9335933 *Gallons.*
2 *Pottles.*

18671867 *Pottles.*
2 *Quarts.*

37343734 *Quarts.*
2 *Pints.*

74687469 *Pints.*

In 7689 *Tuns*, how many *Pints?*

In 57694 *Hogſheads*, how many *Rundlets*, each containing 5 *Galls.* $\frac{3}{4}$.

Anſwer, 632125.

Cloth Meaſure.

In 76874687 *Nails*, how many *Quarters* and *Yards?*

4 *Nails.*

19218671 *Quarters and* 3 *Nails.*

4 *Quarters.*

4804667 *Yards* $\frac{3}{4}$.

4 *Quarters.*

19218671 *Quarters.*

4 *Nails.*

76874687 *Nails.*

In 769458 *Ells Flemiſh*, how many *Quarters*, and *Nails?*

In 87468 *Engliſh*, how many *Nails*, *Quarters*, and *Yards?*

In 68768 Packs, each 40 Cloths, and each Cloth 54 *Yards*, how many *Quarters* and *Nails?*

Anſwer, $\begin{cases} \text{594155520 } \textit{Quarters.} \\ \text{2376622080 } \textit{Nails.} \end{cases}$

CHAP. VII.

Of FRACTIONS.

A FRACTION is a Part or Parts of an *Integer* or whole one, as if you would expreſs 3 Quarters of a *Yard* in Figures, you expreſs it thus, $\frac{3}{4}$ of a *Yard*; or 15 *Shillings* thus, $\frac{3}{4}$ of a *Pound*.

All *Fractions* are expreſt by Two Figures, whereof the Lower denominates the Parts into which the *Integer* is divided, and is called the *Denominator*; and the uppermoſt Figure expreſſeth the Number of theſe Parts that the *Fraction* contains, and is called the *Numerator*.

3 *Numerator.*
4 *Denominator.*

Note that 1 or an *Unit*, is not always the *Integer* or Whole, but any Number of *Pounds* may be put for the Whole; as if the Stock of 6 Merchants be 1000 *l.* then you may expreſs the Sixth Part of the Stock thus:

$\frac{1}{6}$ of 1000 *l.*

If the *Numerator* of any *Fraction* be leſs than the *Denominator*, then that *Fraction* is leſs than an *Integer*, and is called a proper *Fraction*; ſuch as

$$\frac{4}{8}$$

If the *Numerator* of a *Fraction* is greater than the *Denominator*, ſuch a *Fraction* is greater than an *Integer*, and is called an improper *Fraction*; as

$$\frac{8}{4}$$

If the *Numerator* of a *Fraction* is equal to the *Denominator*, then that *Fraction* is equal to one whole *Integer* or Sum; as,

$$\frac{5}{5}$$

The Reaſon of all theſe is evident; for the *Integer* contains (as is ſhown) juſt ſo many Parts as the *Denominator* does expreſs.

If any *Integer* be divided into Parts, and ſome of theſe be ſubdivided into other Parts, then theſe laſt Parts are expreſs'd with Two *Fractions*, with the Word (of) between them; ſo 3 *Farthings* will be expreſs'd thus, $\frac{3}{4}$ of a *Penny*, of $\frac{1}{12}$ of a *Shilling*, of $\frac{1}{20}$ of a *Pound*; Thus,

$$\frac{3}{4} \text{ of } \frac{1}{12} \text{ of } \frac{1}{20}.$$

And ſuch a *Fraction* is called a *Fraction* of a *Fraction*.

If a whole Number has a *Fraction* joyn'd to it thus,

$$\overset{l.}{4}\ \frac{1}{2}$$

Then it is called a *Mixt Number*.

Reduction.

1*ſt*, To reduce a *Fraction* of a *Fraction* into one ſingle *Fraction*, multiply all the *Numerators* continually, the *Product* is a new *Numerator*; alſo multiply all the *Denominators* continually, the *Product* is a new *Denominator*.

EXAMPLE.

I would have reduced $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ of a *Pound* into one Denomination.

I ſay 2 and 3 is 6, and 4 times 6 is—24 *Numerator.*
I ſay 3 and 4 is 12, and 5 times 12 is—60 *Denominator.*

I find the Anſwer to be $\frac{24}{60}$ of a *Pound.*

2*dly*, To reduce a greater *Fraction* into a leſſer Term, or to abbreviate a *Fraction.*

Firſt, by a General Rule, divide the *Denominator* by the *Numerator*, and the *Numerator* by the *Remainder*, (if any be) and thus continue dividing the *Diviſor* by the *Remainder*, till you find a *Diviſor* that divides without leaving a *Remainder.*

EXAMPLE.

$\frac{6154}{8326}$

```
6154) 8326 (1
      6154
      ----
      2172) 6154 (2
            4344
            ----
            1810) 2172 (1
                  1810
                  ----
                   362) 1810 (5
                        1810
                        ----
                           0
```

Then divide both the *Numerator* and *Denominator* by the laſt *Diviſor.*

EXAMPLE.

```
362)6154(17 Numerator.    362)8326(23 Denominator.
    362                       724
    ----                      ----
    2534                      1086
    2534                      1086
    ----                      ----
      00                        00
    ----                      ----
```

So that $\frac{17}{23}$ is equal to $\frac{6154}{8326}$.

Laſtly, When you can divide any of the 9 Figures, in the *Numerator* and *Denominator* without a *Remainder*, divide them both by that Figure, and take their *Quotients* in their ſtead.

EXAMPLES.

$\frac{120}{240} \Big| \frac{60}{120} \Big| \frac{30}{60} \Big| \frac{15}{30} \Big| \frac{3}{6} \Big| \frac{1}{2}$

So that $\frac{1}{2}$ is equal to $\frac{120}{240}$.

3*dly*, To Reduce a whole Number into an improper *Fraction*, place 1 under the whole Number as a *Denominator*; thus,

$\frac{10}{1}$ of a *Pound.*

4*thly* To Reduce improper *Fractions* into whole Numbers.

$\frac{26}{5}$

Divide the *Numerator* by the *Denominator*, and the *Quotient* is the Number ſought.

```
       l.                       s.
5) 26 (5 — 1/5 of a Pound, or   4
   25
   --
    1
```

5*th*, To reduce 2, 3, or more *Fractions* that have unequal *Denominators*, to *Fractions* of the ſame value that have equal *Denominators*.

EXAMPLE.

$\frac{2}{3}$ $\frac{3}{4}$ $\frac{4}{5}$

Multiply all the *Denominators* together for a common *Denominator*, ſaying 3 times 4 is 12, and 12 times 5 is 60.

Then multiply the *Numerator* of the firſt in all the other *Denominators*, except its own *Denominator*, as 2 times 4 is 8, and 5 times 8 is 40.

Then multiply the ſecond *Numerator* in all the *Denominators* except its own *Denominator*, as 3 times 3 is 9, and 5 times 9 is 45.

Then multiply the third *Numerator* in all the *Denominators*, except its own *Denominator*, as 3 times 4 is 12, and 12 times 4 is 48. See the Work.

$$\begin{array}{ccc} 40 & 45 & 48 \\ \hline \frac{2}{3} & \frac{3}{4} & \frac{4}{5} \\ \hline & 60 & \end{array}$$

	Proof.
So that $\frac{40}{60}$ is equal to $\frac{2}{3}$	$\frac{40}{60} \mid \frac{20}{30} \mid \frac{10}{15} \mid \frac{2}{3}$
$\frac{45}{60}$ is equal to $\frac{3}{4}$	$\frac{45}{60} \mid \frac{15}{20} \mid \frac{3}{4}$
$\frac{48}{60}$ is equal to $\frac{4}{5}$	$\frac{48}{60} \mid \frac{24}{30} \mid \frac{12}{15} \mid \frac{4}{5}$

6th, To Reduce a whole Number joyned with a *Fraction* into one Name.

EXAMPLE.

Yards

$$\begin{array}{c} 6-\frac{1}{2} \\ 2 \\ \hline 13 \\ \hline 2 \end{array}$$

Facit. $\frac{13}{2}$

7th, How to find the Value of a ſingle *Fraction* in the known Parts of the *Integer*, either of Money, Weight, or Meaſure.

Multiply the *Numerator* of the *Fraction*, by the Number of the known Parts of the next inferior *Denomination* which are equal to the *Integer*, and divide that *Product* by the *Denominator*, ſo is the *Quotient* the Value of the *Fraction* in that inferior *Denomination.*

And if there happens to be any *Fraction* in the *Quotient* (or *Remainder* of the *Diviſion*) you may find the Value thereof in the next inferior *Denomination* by the ſame Rule, and ſo proceed to the leaſt known Parts, as is taught in *Diviſion.*

EXAMPLE.

What is the $\frac{7}{11}$ of a *Pound* Sterling.

140

$\frac{7}{11}$ of $\frac{20}{1}$ *Shillings.*

11) 140 (12 *Shill.*
11

30
22

8 *Shil.* remains
12

11) 96 (8 *Pence.*
88

8 *Pence* rema.
4

11) 32 (2 *Farthings*
22

10 remains.

So that $\frac{7}{11}$ of 20 *Shillings* is equal

		s.	*d.*		
	to	12	8	$\frac{1}{2}$	$\frac{10}{11}$ of a *Farth.*
$\frac{4}{11}$ of 20 *s.*		7	3	$\frac{1}{4}$	$\frac{1}{11}$
Proof		20	0	0	

Examples for the Learner's Practice.

What is the $\frac{7}{9}$ of an *Ell Engliſh*?
Anſwer, 3 *qrs.* 3 *na.* $\frac{5}{9}$ of a *Nail.*
What is the $\frac{4}{5}$ of a *Yard*? Anſwer 3 *qrs* $\frac{1}{5}$.
What is the $\frac{5}{8}$ of a *Crown.* Anſwer 4 *s.* 2 *d.*
What is the $\frac{9}{10}$ of a Hundredweight?
Anſwer, 3 *qrs.* 16 lb. 12 *oz.* $\frac{8}{10}$.

What is the $\frac{6}{7}$ of Barrel of Beer?

Anſwer, 30 *Gall.* 3 *qrts.* 0 *pt.* $\frac{6}{7}$.

What is the $\frac{3}{4}$ of a Tun of Iron? Anſw. 15 C.

What is the $\frac{9}{11}$ of a Tun of Wine?

What is the $\frac{6}{8}$ of a Quarter of Wheat?

What is the $\frac{7}{10}$ of a Mark?

What is the $\frac{4}{8}$ of a Chaldron of Coals?

What is the $\frac{3}{8}$ of a Hogſhead of Wine?

What is the $\frac{8}{12}$ of a Gallon?

What is the $\frac{2}{3}$ of a Groſs.

l. *s.* *d.*
What is the $\frac{5}{6}$ of 687—19—11 $\frac{3}{4}$
20 *Shillings.*

13759
12 *Pence.*

165119
4 *Farthings.*

660479
Multiply by 5 *Numerator.*

3302395
Divide by 6 *the Denominator.*

Farthings 550399 $\frac{1}{6}$ of a *Farthing.*
4

Pence 137599 $\frac{3}{4}$
12

Shillings 1146|6—7
2|0

573—6—7—$\frac{3}{4}$ $\frac{1}{6}$, this is the $\frac{5}{6}$th Part of 687 *l.* 19 *s.* 11 *d.* $\frac{3}{4}$.

What is the $\frac{1}{6}$ 660479 *Farthings.*

Divide by 6 the *Denominator.*

Farthings 110079 $\frac{5}{6}$ of a *Farth.*

4

Pence 27519 $\frac{3}{4}$

12

Shill. 229|3—3

2 |0

114-13-3 $\frac{3}{4}$ $\frac{5}{6}$ the $\frac{1}{6}$th Part of

573-06-7 $\frac{3}{4}$ $\frac{1}{6}$ 687 *l.* 19 *s.* 11 *d.* $\frac{3}{4}$

Proof 687-19-11 $\frac{3}{4}$

What is the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of 10 *Shillings* ?

6

$\frac{1}{2}$ of $\frac{2}{4}$ of $\frac{3}{4}$

24

720

$\frac{6}{24}$ of $\frac{120}{1}$

24)720(30 *Pence*, or the $\frac{1}{4}$ of an *Angel* is equal to the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of an *Angel.*

72

00

8*th*, To reduce *Fractions* of *Fractions* into 1 ſingle *Fraction*.

$\frac{6}{24} | \frac{3}{15} | \frac{1}{4}$ of 10 *s.*

$$\begin{array}{l} \quad\ \textit{s.}\ \ \textit{s.}\ \ \textit{d.} \\ 4)10(2-6 \\ \quad\ \ 8 \\ \quad\ \overline{} \end{array}$$

$\frac{2}{4} | \frac{1}{2}$ of a *Shil.* or 6 *d.*

ADDITION.

Addition of ſingle *Fractions*, if they have one common *Denominator*, then add their *Numerators*, and ſet their Sum above the common *Denominator*.

EXAMPLE.

Add $\frac{2}{6}$ and $\frac{4}{6}$ together, $\frac{2}{6}$ $\frac{4}{6}$ Anſ. $\frac{6}{6}$ or one whole one.

Addition of Fractions of Fractions.

Firſt reduce the *Fractions* of *Fractions* to ſingle *Fractions*, as is taught in *Reduction*, and then add them as is taught.

EXAMPLE.

$$\begin{array}{ccccccc} & \multicolumn{2}{c}{6} & & \multicolumn{2}{c}{15} & \\ \text{Add} & \frac{1}{3} \text{ of} & \frac{6}{7} & \text{and} & \frac{3}{5} \text{ of} & \frac{5}{8} & \text{together.} \\ & \multicolumn{2}{c}{21} & & \multicolumn{2}{c}{40} & \end{array}$$

$$\begin{array}{cc} \multicolumn{2}{c}{240} \\ \hline \frac{6}{21} & \frac{15}{40} \\ \hline \multicolumn{2}{c}{315} \end{array}$$

Anſwer, $\frac{240}{315}$.

Add $\frac{7}{8}$ of 3 *Pounds* Sterling to the $\frac{3}{4}$ of a *Penny*, I reduce the $\frac{3}{4}$ of a *Penny* into this: *Viz.* $\frac{3}{4}$ of $\frac{1}{12}$ of $\frac{1}{20}$.

3	6720
$\frac{3}{4}$ of $\frac{1}{12}$ of $\frac{1}{20}$	$\frac{3}{960}$ to $\frac{7}{8}$
960	7680

Anſwer, $\frac{6720}{7680}$

Addition of Mixt Numbers.

Firſt find the Sum of the *Fraction* joyned to them (by the foregoing Rules) and if there be any *Integers* in that Sum, add them to the *Integers*, and place their Sum, and the Fraction remaining (if there remains any) together, and then you have the Total Sum.

EXAMPLE.

Six Perſons was to pay their following Shares of 6 *l.* 0 *s.* 5 *d:* $\frac{1}{2}$.

		l.	*s.*	*d.*	*qrs.*	
A.	was to pay	0	14	04	0	$\frac{14}{42}$ of a *Farthing.*
B.		1	02	11	$\frac{2}{4}$	$\frac{14}{42}$
C.		1	08	08	0	$\frac{28}{42}$
D.		1	00	00	$\frac{3}{4}$	$\frac{28}{42}$
E.		1	00	00	$\frac{3}{4}$	$\frac{28}{42}$
F.		0	14	04	0	$\frac{14}{42}$
	Total	6	00	05	$\frac{1}{2}$	

Three Perſons was to pay the Sum of 14 *l.* *viz.*

	l.	
A. was to pay	7	
B. was to pay	4	$\frac{90}{100}$
C. was to pay	2	$\frac{10}{100}$
Total	14 *l.*	

And thus you may add *Fractions* of any other differing Denominations.

SUBSTRACTION.

Is the taking of one *Fraction* from another, a Leſs from a Greater, or an Equal from an Equal.

If the *Fractions* be ſingle *Fractions*, and have equal *Denominators*, then ſubſtract the leſſer *Numerator* from the greater, and place the *Remainder* over the common *Denominator*.

EXAMPLE.

Subſtract $\frac{4}{7}$ from $\frac{6}{7}$ and there remains $\frac{2}{7}$, and $\frac{2}{4}$ from $\frac{3}{4}$ and there remains $\frac{1}{4}$.

Subſtraction of Fractions of Fractions.

Firſt reduce them to ſingle *Fractions* of the ſame Denomination, and then ſubſtract as is taught.

EXAMPLE.

Subſtrract $\frac{1}{4}$ of $\frac{4}{8}$ from $\frac{1}{5}$ of $\frac{7}{9}$.

$$\begin{array}{c} 4 \\ \hline \frac{1}{4}\ \text{of}\ \frac{4}{8} \\ \hline 32 \end{array} \qquad \begin{array}{c} 7 \\ \hline \frac{1}{5}\ \text{of}\ \frac{7}{9} \\ \hline 45 \end{array} \qquad \begin{array}{cc} \multicolumn{2}{c}{44} \\ \hline 180 & 224 \\ \frac{4}{32} & \frac{7}{45} \\ \hline \multicolumn{2}{c}{1440} \end{array}.$$

Anſwer, $\frac{44}{1440} | \frac{22}{720} | \frac{11}{360}$.

To ſubſtract a Fraction from a whole Number.

Reduce the whole Number to a *Fraction*, having the ſame *Denominator* with the *Fraction* given, and then ſubſtract thus: *EXAMPLE.*

EXAMPLE.

Subſtract $\frac{3}{6}$ from 5 *l.*

$\frac{3}{6}$ from $^{3}\frac{0}{6}$ and there remains $^{2}\frac{7}{6}$ which being divided by the *Denominator* 6)27(4 *l.* $\frac{3}{6}$ or 10. *s.*

24

Remains $\frac{3}{6}$ of a *Pound.*

Proof.

Lent	5 *l.*	
Paid	0	$\frac{3}{6}$
l.	4	$\frac{3}{6}$
	5 *l.*	

Lent	6 *l.*	
Paid	0	$\frac{3}{4}$
l.	5	$\frac{1}{4}$
Proof	6 *l.*	

To ſubſtract a whole Number and a *Fraction* from a whole Number and a *Fraction.*

Reduce your *Fractions* into one Denomination, then ſubſtract the one *Numerator* from the other, and for the *Integers* ſubſtract as you were taught in whole Numbers.

EXAMPLE.

	l.	
Received	40	$\frac{6}{8}$
Paid	24	$\frac{5}{7}$
Remains	16	$\frac{2}{56}$

2

40 42

$\frac{6}{8}$ $\frac{5}{7}$

56

	l.	
Received	27	$\frac{3}{4}$
Paid	17	$\frac{1}{2}$
Remains	10	$\frac{1}{4}$

or it may be work'd thus

2

6

$\frac{3}{4}$ $\frac{1}{2}$

8

Remains $\frac{2}{8}$ or $\frac{1}{4}$

Bought

	C.		lb.	
Bought	14	$\frac{1}{2}$	14	$\frac{1}{2}$ of 28 is 14
Sold	10	$\frac{2}{7}$	8	$\frac{2}{7}$ of 28 is 8
Remains	4		$\frac{6}{28}$	

To know which of any two or more *Fractions* is greateſt.

Reduce them to the ſame Denomination, and then thoſe that have the greateſt *Numerators* are the greateſt *Fractions.*

MULTIPLICATION.

If the *Fractions* are to be multiplied by ſingle *Fractions*, then multiply the *Numerators* one into another, and ſet that *Product* for a new *Numerator*, alſo multiply the *Denominators* one into another for a new *Denominator*, the new *Fraction* gives the *Product.*

EXAMPLE

Mul iply $\frac{2}{3}$ by $\frac{3}{4}$. Anſwer $\frac{6}{12}$ or $\frac{1}{2}$.

Alſo $\frac{2}{3}$ of $\frac{4}{8}$ and $\frac{3}{4}$ multiplied, continually make $\frac{24}{96}$ or $\frac{1}{4}$

If the Numbers be mixt Numbers, or whole Numbers and *Fractions*, reduce them into ſingle *Fractions*, and then multiply them as is taught.

15 2

Multiply $\frac{3}{5}$ of $\frac{5}{6}$ by $\frac{1}{2}$ of $\frac{2}{3}$

30 6

30

$\frac{15}{30} + \frac{2}{6}$

180

Or this Way

$\frac{15}{30} . \frac{5}{10} . \frac{1}{2}$ $\frac{2}{6}$ $\frac{1}{3}$

$\frac{30}{180} | \frac{15}{90} . \frac{5}{30} | \frac{1}{6}$ Anſwer.

1

$\frac{1}{2} + \frac{1}{3}$ Anſwer $\frac{1}{6}$.

6

Multiply 5 by $\frac{4}{5}$

20

$\frac{5}{1}$ -|- $\frac{4}{5}$ $\quad$ 5)20(4 Anſwer.

5 $\quad$ 20

———

00

———

Multiply 3 and $\frac{2}{4}$ by 6

$3\ \frac{2}{4}$

4

———

$\frac{14}{4}$

84

$\frac{14}{4}$ -|- $\frac{6}{1}$

4 $\quad$ 4)84(21 Anſ.

8

———

04

4

———

0

Multiply 3 and $\frac{1}{4}$ by 2 and the $\frac{1}{3}$.

$3\ \frac{1}{4}$ $\qquad$ $2\ \frac{1}{3}$

4 $\qquad$ 3

——— $\qquad$ ———

$\frac{13}{4}$ $\qquad$ $\frac{7}{3}$

91

$\frac{13}{4}$ -|- $\frac{7}{3}$

12 $\quad$ 12)91(7 $\frac{7}{12}$ Anſwer.

84

———

7

———

12

DIVISION.

If the Numbers given be ſingle *Fractions*, then multiply the *Numerator* of the *Dividend* into the *Denominator* of the *Diviſor*, the *Product* is a new *Numerator*; alſo multiply the *Denominator* of the *Dividend* into the *Numerator* of the *Diviſor*, the *Product* is a new *Denominator*, the *Fraction* is the *Quotient*.

EXAMPLE.

EXAMPLE.

Divide $\frac{2}{3}$ by $\frac{1}{5}$

$$\begin{array}{c} 10 \\ \frac{2}{3} -|- \frac{1}{5} \\ 3 \end{array}$$ *Quotient* $\frac{10}{3}$.

I demand the *Quotient* of $\frac{3}{4}$ by $\frac{2}{6}$.

$$\begin{array}{c} 18 \\ \frac{3}{4} -|- \frac{2}{6} \\ 8 \end{array}$$ *Quotient* $\frac{18}{8}$ or 2 *Integers* $\frac{2}{8}$.

I demand the *Quotient* of $\frac{11}{12}$ by $\frac{1}{2}$.

$$\begin{array}{c} 22 \\ \frac{11}{12} -|- \frac{1}{2} \\ 12 \end{array}$$

Inte.

12)22(1 $\frac{10}{12}$ or $\frac{5}{6}$ of an *Integer.*

12

$\frac{10}{12}$

To divide whole Numbers and Fractions.

I demand the *Quotient* of 54 by $\frac{3}{7}$.

$$\begin{array}{c} 378 \\ \frac{54}{1} -|- \frac{3}{7} \\ 3 \end{array}$$

Inte.

3)878(126 *Quotient.*

3

07

6

18

18

0

Divide $\overset{l.}{2}\,\frac{2}{3}$ by $\overset{l.}{1}\,\frac{1}{5}$.

$\frac{3}{8/3}$ $\frac{5}{6/5}$

$\frac{8}{3}\overset{40}{\underset{18}{-|-}}\frac{6}{5}$ $\frac{40}{18}$ *Quotie*

$\overset{l.}{18)40(2\,\frac{4}{18}}$ or $\frac{40}{\frac{2}{9}\text{ of }\frac{20}{1}\text{ s.}}$

36

$\frac{4}{18}$

9)40(4 *Shillings.*

36 48

$\frac{4}{9}$ of $\frac{12}{1}$ *Pence.*

9)48(5 *Pence.*

45 12

$\frac{3}{9}$ of $\frac{4}{1}$ *Farthi*

9)12(1 *Far*

9

$\frac{3}{9}$ of a *F*

So that I find 2 *l.* $\frac{2}{3}$ divided by 1 *l.* $\frac{1}{5}$, the *Quotient* comes to 2 *l.* 4 *s.* 5 *d.* $\frac{1}{4}$ $\frac{3}{9}$ of a *Farthing.* See the Work.

To divide Fractions of Fractions.

Divide $\frac{2}{3}$ of $\frac{3}{4}$ by $\frac{2}{8}$ of $\frac{9}{10}$.

6 18

$\frac{2}{3}$ of $\frac{3}{4}$ $\frac{2}{8}$ of $\frac{9}{10}$

12 80

$\frac{6}{12}\overset{480}{\underset{216}{-|-}}\frac{18}{80}$ $\frac{480}{216}$ *Qu*

Int.

216)480(2 $\frac{48}{216}$

432

48

CHAP. VIII.

The Rule of THREE Direct.

SO called, becauſe in it there are Three Numbers given to find a Fourth, It is alſo called the *Golden Rule*, becauſe of its frequent and moſt excellent Uſe; and therefore for the working thereof, mark well this
neral Rule.

Note, That you bring your Firſt and Third Num-
s into One Denomination or Name, and your
ddle Number into the loweſt Name mentioned.
en multiply your Second Number under your
ird, and divide that *Product* by the Firſt, and the
tient will anſwer the Queſtion in ſuch a Deno-
ation or Name, as you left your Middle Num-
in.

hat is, if your Middle Number is *Pounds*, your
tient will be *Pounds*; if your Middle Number
hillings, your *Quotient* will be *Shillings*; if your
ddle Number is *Pence*, your *Quotient* will be
ce; if your Middle Number is *Farthings*, your
tient will be *Farthings*, &c.

If 8 Yards of Cloth coſt 4 *l.* 10 *s.* 8 *d.* what w
24 Yards coſt ?

Yards *l.* *s.* *d.* *Yards*
If 8 coſt——4—10—8 what will——24 coſt.
20 *Shil.* Multiply by 1088 Secon
Numb
90 *Shillings.* 192
12 *Pence.* 192
240
1088 *Pence.*
26112
Divide by 8 Firſt Num

Yds. *l.* *s.* *Yds.* 3264 *Pence.*
If 24 coſt—13—12 what will 8 coſt. 12 *Pence.*
20 *Shillings.*
27|2 *Shil.*
272 2|0 *Shil.*
12
Anſwer 13—12
3264
8
24)26112 (1088
24 12
211 9|0—8
192 2|0
192 4—10—8 Proof.
192
0

So that 24 Yards will come to 13 *l.* 12 *s.*
the Work.

If 6 Ounces of *Cinnamon* coſt 2 *s.* 8 *d.* what will 16 lb. 8 *oz.* coſt.

oz. *s.* *d.* lb *oz.*
If 6 coſt———2—8———16—8
12 *Pence.* 16 *Ounces.*
32 *Pence.* 104
16
264 *Ounces.*
Multiply by 32 Second Number.
528
792
8448
Divide by 6 the Firſt Number.
1408 *Pence.*
12 *Pence.*
11'7—4 *d.*
2,0
Anſw. 5—17—4 *d.*

So that 16 lb. 8 *oz.* will coſt 5 *l.* 17 *s.* 4 *d.* See the Work.

If 1 Pound of *Tobacco* coſt 1 *s.* 8 *d.* what will 4 C. $\frac{3}{4}$ 16 lb. coſt.

lb *s.* *d.* C. lb.
If 1 coſt———1—8———4—$\frac{3}{4}$—16
12 *Pence.* 4 *Quarters.*

20 19 *Quarters.*
28 *Pounds.*

158.
39

548 *Pounds weight.*
Multiply by 20 Second Number.

10960 *Pence.*
12 *Pence.*

91|3—4
2|0

Anſ. 45—13—4

So that 4 C. $\frac{3}{4}$ 16 lb. at 20 *d. per* Pound, comes to 45 *l.* 13 *s.* 4 *d.* See the Work.

If 1 Buſhel of *Coals* coſt 11 *d.* what will 16 Chaldron, each 36 Buſhels, coſt?

Buſhel *d.* *Chaldron* *Buſhels.*
If 1 coſt————11————16 each 36
4 *Farthings* 36 *Buſhels.*
44 *Farthings.* 96
48
576 *Buſhels.*
44 Second Numb.
2304
2304
25344
4 *Farthings.*
6336 *Pence.*
12 *Pence.*
52|8 *Shillings.*
2|0
Anſwer 26--8 *s.*

If 3 Ounces of *Plate* be worth 15 *s.* 9 *d.* what will 54 Ounces be worth?

oz. *s.* *d.* *oz.*
If 3 cost ——— 15—9 ——— 54 cost.
12 *Pence.* 189 Second Number.

189 486
432
54

10206
Divide by 3 the First Number.

3402 *Pence.*
12 *Pence.*

28|3—6
2 |0 *Shillings.*

L. 14—3—6

So that 54 Ounces comes to 14 *l.* 3 *s.* 6 *d.* See the Work.

If 12 lb. of *Currants* cost 6 *s.* 6 *d.* what will 48 Frails, each ¾ 16 ~~lb. cost~~ ?

lb — *s.* *d.* — *Frails* — lb
If 12 cost——6—6——48 each ¾—16
12 *Pence.* — 28 *Pounds in* 1 *Quarter*

78 *Pence.* — 30
7

100 *Pounds in one Frail.*
48 *Frails.*

800
400

4800 lb *in all the Frails.*
78 Second Number.

38400
33600

374400
Divide by 12 the First Number.

31200 *Pence.*
12 *Pence.*

260|0 *Shillings.*
2 |0 *Shill.*

130

So that 48 Frails, each ¾ 16 lb *wt.* comes to 130 *l.*

If 8 Pair of *Stockings* coſt 48 *Shillings*, what will 120 Dozen Pair coſt.

Pair *s.* *Dozen*
If 8 coſt———48———120 Pair coſt
12 *Pair in one Dozen.*

1440 *Pair in all.*
48 *Shil.* Second Numb.

11520
5760

69120
Divide by 8 the Firſt Number.

864|0 *Shillings.*
2 |0

432 *l.*

So that 120 Dozen Pair of *Stockings* at 6 *Shilling*
per Pair, comes to 432 *Pounds.*

Bough

Bought 10 Packs of *Cloth*, each Pack containing 26 *Cloths*, and each *Cloth* 27 Yards at 7 *s.* 9 *d. per* Yard. I demand how much it comes to in all?

10 *Packs.*
26 *Cloths in* 1 *Pack.*

60
20

260 *Cloths in all.*
27 *Yards in* 1 *Cloth.*

1820
520

Yard *s.*
If 1 cost——7—9——7020 *Yards in all.*
12 *Pence.* 93

93 *Pence.* 21060
63180

652860 *Pence.*
12 *Pence.*

5440|5 *Shillings.*
2 |0 *Shillings.*

Answer 2720—5 *s.*

Proof.

Yards *l.* *s.* *Yard.*
If 7020 coſt ———— 2720—5 ———— 1 coſt.
20 *Shillings.*

54405 *Shillings.*
12 *Pence.*

7020)652860 (93 *Pence.*
63180 (12 *Pence:*

21060 7 *s.* 9 *d.* *the Price of one Yard.*
21060 ——

00

Bought of ſeveral Perſons 650 C. $\frac{3}{4}$ 10 lb. of *Currants* at 4 *d.* $\frac{3}{4}$ *per* Pound, to whom I have ſold 709 C. $\frac{1}{4}$ 16 lb. of *Sugar* at 4 *d.* $\frac{1}{4}$ *per* Pound. I deſire to know what remains for me to pay, they having taken the *Sugar* in part of Payment ?

lb —— *d.* —— C. —— lb
If 1 ———— 4—$\frac{3}{4}$ ———— 650—$\frac{3}{4}$—10
4 *Farthings.* —— 4 *Quarters.*
19 *Farthings.* —— 2603 *Quarters.*
28 *Pounds.*
20824
5207
72894 *Pounds.*
19 Second Number.
656046
72894
1384986 *Farthings.*
4
346246—$\frac{1}{2}$ *Pence.*
12
2885|3—10
2|0

Answer 1442—13—10 $\frac{1}{2}$

lb d. C. lb
If 1 ——— 4—¼ ——— 709—¾—16
4 *Farthings.* 4 *Quarters.*

17 *Farthings.* 2837 *Quarters.*
28 *Pounds.*

22702
5675

79452 *Pounds.*
17 Second Number.

556164
79452

1350684 *Farthings.*
4

337671 *Pence.*
12

l. *s.* *d.*
1442--13--10 ½ 2813|9—3
1406--19-- 3 2 |0

Anſ. 1406—19—3 *d.*

To pay 35--14-- 7 ½

A Gentleman ſpends 1 *l.* 6 *s.* 8 *d.* a Day, and lays up at the Year's end 598 *l.* to purchaſe withal, I demand what his Yearly Income amounts to?

Anſwer, 1084 *l.* 13 *s.* 4.

A Ship ſailed 48 Leagues in 24 Hours, how many Leagues will ſhe ſail in a Week with the like Wind?

Anſwer, 336 Leagues.

If 8 lb. of Pepper coſt 4 *s.* 8 *d.* what will 7 C. $\frac{3}{4}$ 14 lb. coſt? Anſwer, 25 *l.* 14 *s.* 6 *d.*

If 1 lb. of Gauls coſt 15 *d.* how many Hundred-weight ſhall I have for 122 *l.* 10 *s.* 8 *d.*

Anſwer, 17 C. $\frac{2}{4}$.

By our Factor's Account out of *Barbadoes* there is made of the Neat-Sail of 120 Dozen of Shoes 89 C. $\frac{1}{2}$ 21 lb, of Sugar, I demand how much of the Sugar my Partner is to have for 74 Dozen, which was his?

Anſwer, 55 C. $\frac{1}{4}$ 6 lb.

A Gentleman ſold a Leaſe of a Parcel of old Houſes of 175 *l.* 12 *s.* *per Annum* for 12 Years $\frac{1}{2}$ Purchaſe, what will the Purchaſe-Money amount to?

Anſwer 2195 *l.*

A Draper ſold 36 Cloths for 432 *l.* 16 *s.* 6 *d.* by which he gained as much as one ſtood him in, I demand the Price of one Cloth?

Anſwer, 12 *l.* 0 *s.* 5 *d.* $\frac{18}{37}$.

A Merchant paid 496 *l.* 13 *s.* 11 *d.* for a Parcel of Cloth, and when he had computed it, found that an Ell *Flemiſh* coſt him 2 *s.* 6 *d.* what Quantity had he for his Money at that Rate.

Anſwer, 3973 *Ells*, $\frac{17}{30}$.

A Captain had 2889 *l.* 10 *s.* 8 *d.* to maintain a certain Number of Soldiers, how many will it maintain for 2 Years, 11 Months, 17 Days, allowing each Man 7 *d.* $\frac{1}{2}$ *per* Day?

Anſwer, 87 *Men*, $\frac{25}{31}$.

A Merchant delivered at *London* 120 *l.* *Sterling* to receive 207 *l.* *Flemiſh* at *Rotterdam*, what was 1 *l.* *Sterling* valued at in *Flemiſh* Money?

Anſwer 1 *l.* 14 *s.* 6 *d.*

A Seaman ſailed in a Man of War from the 20th of *November* 1704. to the 20th of *April* 1708. what comes his Wages to at 1 *l.* 8 *s.* 6 *d.* *per* Month?

Anſwer 62 *l.* 14 *s.*

If a Piece of Ordnance ſhoot 14 lb. $\frac{3}{4}$ of Powder at a Time, how many Pounds will diſcharge the ſame 68 Times, and what comes the Powder to at 11 *d.* $\frac{1}{4}$ *per* Pound?

Anſwer, { 1003 Pounds of Powder.
comes to 47 *l.* 0 *s.* 3 *d.* $\frac{3}{4}$

A Draper lays out 120 *l.* the $\frac{1}{3}$ of it in Callicoes at 20 *s.* 5 *d.* *per* Piece, the $\frac{1}{3}$ in Cambricks at 32 *s.* 9 *d.* *per Piece*, and the reſt in Holland at 5 *s.* 9 *d.* *per* Ell. I deſire to know how much he had of each Sort?

Anſwer, { *Callicoes* 39 Pieces $\frac{45}{245}$ of a Piece.
Cambricks 24 Pieces $\frac{168}{393}$ of a Piece.
Holland 139 Ells $\frac{9}{69}$ of an Ell.

A Draper bought 120 Yards of Holland Cloth, for which he gave 31 *l.* I deſire to know how he muſt ſell it *per* Yard, to gain 10 *l.* 6 *s.* 8 *d.* in the whole Sale of 120 Yards?

Anſwer, 6 *s.* 10 *d.*

A Butcher bought an Ox (which weighed beſides Skin and Legs 108 Stone) for 10 *l.* 10 *s.* There was in him 8 Stone $\frac{1}{2}$ of Tallow, which he ſold for 4 *d.* $\frac{3}{4}$ *per* Pound. The Skin and Legs he ſold for 1 *l.* 5 *s.* 9 *d.* How much does one Stone of this Beef ſtand him in?

Anſwer, 18 *d.* $\frac{3}{4}$ $\frac{716}{756}$.

A Plummer bought 268 Fodder of Lead each weighing 19 *C.* $\frac{1}{4}$ 20 lb. at 1 *d.* $\frac{1}{4}$ *per* Pound, I demand what the whole Quantity coſt him?

Anſwer, 3037 *l.* 6 *s.* 8 *d.*

A. and *B.* barter; *A.* hath 265 Pipes of Wine at 25 *l.* *per* Pipe, for which *B.* giveth him in ready Money 879 *l.* and the reſt in Caſks at 7 *s.* 9 *d.* *per* Caſk; I demand how many Caſks he muſt have beſides the ready Money?

Anſwer 15322 *Caſks*, $\frac{60}{90}$

A

A Merchant took into his Hands of an Orphans Eſtate 1421 *l.* 16 *s.* 8 *d.* which he kept 13 Years, and at the End thereof he returned Principal and Intereſt upon Accompt and in Money 2319 *l.* 12 *s* 6 *d.* I demand what Rate he allowed *per Cent. per Annum*, reckoning only Simple Intereſt?

Anſwer, 4 *l.* 17 *s.* 1 *d.*

A Merchant bought 30 Pieces of Broad-Cloth, each Piece containing 32 Yards $\frac{1}{2}$, at 12 *s.* 6 *d.* $\frac{1}{2}$ *per* Yard; I demand how much he paid for the whole; and if he ſell it again for 16 *s.* 8 *d. per* Yard, how much will he gain by the Bargain, and how much upon every 100 *l.* of Money?

A Merchant departed with an Eſtate from *London* to *Venice*, and there gained 25 *Dollars per Cent.* and ſpent of his neat Gains 1864 *Dollars*; and when he had ballanced his Accompts, found he had remaining 38679 *Dollars*, I demand what he carried with him? Anſwer, 29010 *Dollars.*

A Merchant ſhipp'd for *Spain* 364 Pieces of Broad-Cloth, each Piece containing 54 Yards at 8 *s.* 6 *s. per* Yard, and had returned from thence 5694 *Tuns* of *Malaga* Sack at 11 *d.* $\frac{1}{4}$ *per* Pint, but by tempeſtuouſneſs of the Weather, the Marriners were forced to caſt over-board 488 *Tuns*, 2 *Hogſheads*, the Queſtion is, whether did the Merchant gain or loſe, and how much? Anſwer, 483565 *l.* 19 *s.*

NOTE, *Arithmeticians* generally diſtinguiſh the *Rule of Three* into two Rules, one they call *Direct*, and the other the *Inverſe Rule of Three*, which Diſtinction is nothing elſe but this: If the Number which is in the Firſt Place, is of the ſame Name with that which asketh the Queſtion be the *Diviſor*, then it is the *Rule of Three Direct*; but if the Third

Number asketh the Queſtion be the *Diviſor*, then it is the *Rule of Three Inverſe.*

There are 2400 Solders in Garriſon in a City beſieged, and have Proviſion to ſerve them 9 Months, the Queſtion is how many muſt be disbanded that the Proviſion may ſerve 16 Months ?

```
Months.                    Soldiers.                    Months.
If 9 ———————————————————— 2400 ——————————————————————— 16
                              9 First Number.
                          ———
Third Number 16)21600(1350 Men.
                16···
               ——
                 56
                 48
               ——
                  80                          2400
                  80                          1350
                 ——                          ———
                  00                          1050
                 ——                          ———
```

So that you ſee the Proviſion will ſerve 1350 Men 16 Months, therefore the reſt muſt be disbanded to the Number of 1050, as is found by ſubſtracting 1350 from 2400.

If a Man lend his Friend 350 *l.* for 365 Days, how long Time ought his Friend to lend him 240 *l.* to requite his Courteſie ?

Anſwer, 532 Days $\frac{70}{240}$.

CHAP. IX.

Rules of PRACTICE *with very plain and eaſie* TABLES.

It is neceſſary that the Learner before he proceed, have by Heart theſe following Tables; *viz.*

d.		s.	d.
20	is	1—	8
30		2—	6
40		3—	4
50		4—	2
60		5—	0
70		5—	10
80		6—	8
90		7—	6
100		8—	4
110		9—	2
120		10—	0
130		10—	10
140		11—	8
150		12—	6
160		13—	4
170		14—	2
180		15—	0
190		15—	10
200		16—	8
210		17—	6
220		18—	4
230		19—	2
240		20—	0

s.		d.
1	is	12
2		24
3		36
4		48
5		60
6		72
7		84
8		96
9		108
10		120
11		132
12		144
13		156
14		168
15		180
16		192
17		204
18		216
19		228
20		240

The even Parts of a *Pound.*

s. d.		
10—0	is	$\frac{1}{2}$
6—8		$\frac{1}{3}$
5—0		$\frac{1}{4}$
4—0		$\frac{1}{5}$
3—4		$\frac{1}{6}$
2—6		$\frac{1}{8}$
2—0		$\frac{1}{10}$
1—8		$\frac{1}{12}$
1—0		$\frac{1}{20}$

The even Pts of a *Shilling.*

d.		
6	is	$\frac{1}{2}$
4		$\frac{1}{3}$
3		$\frac{1}{4}$
2		$\frac{1}{6}$
1 $\frac{1}{2}$		$\frac{1}{8}$
1		$\frac{1}{12}$

NOTE, That when the Price of 1 or an *Integer* is an even Part of a *Pound*, divide the *Integers* whoſe Price are required by the *Denominator* of that even Part, the *Quotient* will be the Price of the *Integers*.

If the Price of 1 *Integer* is an equal Part of a *Pound*, your *Quotient* will be *Pounds*; if the Price of an *Integer* is an equal Part of a *Shilling*, the *Quotient* will be *Shillings*, &c.

And obſerve always, that when any Thing remains after *Diviſion*, it is of the ſame Denomination or Name as the *Dividend* was.

EXAMPLES.

Ells *d.*
½ 67486 at 6 *per Ell.*
3374|3 *Shillings.*
2 |0
1687—3

So that 67486 *Ells* comes to at 6 *d. per* Ell, *One thouſand ſix hundred eighty-ſeven Pounds, Three Shillings.*

Yards *d.*
⅓ 7846 at 4 *per Yard.*
261|5—4 *Pence.*
2 |0
L. 130—15—4

lb *d.*
¼ 2768 at 3 *per Pound.*
69|2
2 |0
34—12

Yards *d.*
⅛ 3618 at 2 *per Yard.*
60|3
2 |0
30—3

Ells *d.*
$\frac{1}{8}$ 2760 at 1—½ *per Ell.*

34|5
2|0

17—5

Quarts *d.*
$\frac{1}{12}$ 4896 at 1 *per Quart.*

40|8
2|0

20—8

Having ſhewn you the Even Parts of a *Shilling*, I ſhall now begin with a *Farthing*, *Halfpenny*, *Three-farthings*, &c.

Ells.
$\frac{1}{4}$ 6936 at ¼ *per Ell.*

1734 *Pence.*
12

14|4—6
2|0

7—4—6

Yards
$\frac{1}{2}$ 716 at ½ *per Yard.*

358 *Pence.*
12

2|9—10
2|0

1—9—10

Obſerve always, That when the Price of any one Thing is a *Farthing*, or *Pence* and *Farthings*, the given Number or Top-Line muſt be *Farthings.*

lb

$\frac{1}{2}$ 7467 at $\frac{3}{4}$ *per Pound.*

$\frac{1}{2}$ 3733—$\frac{1}{2}$

1866—$\frac{3}{4}$

5600—$\frac{1}{4}$

12

46|6—8

2|0

23—6—8—$\frac{1}{4}$

The Proof by the Rule of Three.

lb ——— lb

If 1 ——— $\frac{3}{4}$ ——— 7467

3

22401

4

5600—1

12

46|6—8

2|0

23—6—8 $\frac{1}{4}$

The Manner of the working the foregoing Queſtion.

The given Number is 7467 lb. at 3 *Farthings.* Firſt, I ſay 2 *Farthings* is half of a *Penny*, and divide it in the Top-line, and the *Product* is ſo many *Pence*, and there remains a *Halfpenny* ; then I ſay, a *Farthing* is the half of a *Halfpenny*, and divide it in the *Pence*, and there remains 2 *Farthings* and half the remaining *Halfpenny* above, and it makes 3 *Farthings* ; then draw a Line and add both the *Products* together and work as before, and when the Work is finiſhed, you find that 7467 *Pounds* weight comes to at 3 *Farthings* per *Pound*, *Twenty-three Pounds Six Shillings* and *Eight Pence Farthing*.

	Yards d.		*Ounces* d.
$\frac{1}{12}$	5978 at 1 $\frac{1}{4}$ *per Yard.*	$\frac{1}{8}$	7225 at 1—$\frac{3}{4}$ *per Ounce.*
$\frac{1}{4}$	498—2 *d.*	$\frac{1}{6}$	903—1—$\frac{1}{2}$
	124—6—$\frac{1}{2}$		150—6—$\frac{1}{4}$
	62 | 2—8—$\frac{1}{2}$		105 | 3—7—$\frac{3}{4}$
	2 | 0		2 | 0
	31--2—8—$\frac{1}{2}$		52-13--7--$\frac{3}{4}$

Fot the working of one *Penny Farthing*, I ſay 1 *d.* is the $\frac{1}{12}$ of a *Shilling*, and there remains 2 *Pence* ; then I ſay, a *Farthing* is the $\frac{1}{4}$ of a *Penny*, and work it in the Bottom Line of *Shillings*, and there remains 6 *Pence*, and the 4th Part of 2 *Pence* is a *Halfpenny*, then add the two Lines up, and the *Product* is *Shillings* ; and in Caſe of any other Sum with *Farthings*, you muſt work as is above taught, that is, your even Parts of a *Shilling* firſt, and your *Farthings* in your Parts.

Ounces *d.*
$\frac{1}{6}$ 864 at 2—$\frac{1}{4}$ *per Ounce.*
$\frac{1}{8}$ 144
18
16 | 2
2 | 0
8—2

Yards *d.*
$\frac{1}{6}$ 478 at 2—$\frac{3}{4}$ *per Yard.*
$\frac{1}{4}$ 79— 8
$\frac{1}{2}$ 19—11
9—11—$\frac{1}{2}$
10 | 9--06--$\frac{1}{2}$
2 | 0
5--9--06--$\frac{1}{2}$

Bags *d.*
$\frac{1}{6}$ 3789 at 2—$\frac{1}{2}$ *per Bag.*
$\frac{1}{4}$ 631— 6
157—10—$\frac{1}{2}$
78 | 9--04—$\frac{1}{2}$
2 | 0
39--9—04—$\frac{1}{2}$

Ells *d.*
$\frac{1}{4}$ 7896 at 3—$\frac{1}{4}$ *per Ell.*
$\frac{1}{12}$ 1974
164—6
213 | 8—6
2 | 0
106--18--6

lb *d.*
$\frac{1}{4}$ 78964 at 3—$\frac{1}{2}$ *per* lb.
$\frac{1}{6}$ 19741
3290— 2
2303 | 1—2
2 | 0
1151-11--2

Yards *d.*
$\frac{1}{4}$ 7834 at 3—$\frac{3}{4}$ *per Yard.*
$\frac{1}{4}$ 1958—6
489—7—$\frac{1}{2}$
244 | 8—1—$\frac{1}{2}$
2 | 0
122--8—1—$\frac{1}{2}$

Ounces *d.*
$\frac{1}{6}$ $\frac{1}{8}$ 7896 at 4--$\frac{1}{4}$ *per Ounce.*

1316
$\frac{1}{8}$ 1316
164 — 6

279|6—6
2 |0

139-16-6

To work this Sum, I ſay 2 *Pence* is the $\frac{1}{6}$ of a *Shilling* twice, that I may take Parts for a *Farthing*, otherwiſe it would have been the $\frac{1}{16}$ of a *Groat*, and muſt have cauſed a great deal more Work.

Ounces *d.*
$\frac{1}{3}$ 5973 at 4—$\frac{1}{2}$ *perOunce*

$\frac{1}{8}$ 1991
248— 10—$\frac{1}{2}$

223|9— 10—$\frac{1}{2}$
2 |0

111-19--10—$\frac{1}{2}$

Pots *d.*
$\frac{1}{3}$ 971 at 4—$\frac{3}{4}$ *per Pot.*

$\frac{1}{8}$ 323—8 *d.*
$\frac{1}{2}$ 40—5—$\frac{1}{2}$
20—2—$\frac{3}{4}$

38|4--4—$\frac{1}{4}$
2 |0

19--4--4--$\frac{1}{4}$

To work this Sum and all others of this Nature, you muſt take your Parts in your Parts: Firſt, I ſay 4 *Pence* is the $\frac{1}{3}$ Part of a *Shilling*, and the *Product* is *Shillings* ; then I ſay a *Halfpenny* is the $\frac{1}{8}$ of *Four Pence*, and work it in the *Product Shillings* ; then I ſay a *Farthing* is the half of a *Half-penny*, and the work ſtands as above, which is a much ſhorter Way than the

Rule of Three; and the *Rule of Three* is the only Proof as has been ſhewn before.

Yards *d.*
$\frac{1}{3}$ 712 at 5 *per Yard.*
$\frac{1}{4}$ 237—4 *d.*
59—4
29|6—8
2 |0
14-16--8

Ounces *d.*
$\frac{2}{3}$ 3716 at 5—$\frac{1}{4}$ *per Oz.*
$\frac{1}{4}$ 1238—8
$\frac{1}{4}$ 309—8
77—5
162|5—9
2 |0
81-5—9

Ells *d.*
$\frac{1}{3}$ 8796 at 5—$\frac{1}{2}$ *per Ell.*
$\frac{1}{4}$ 2932
$\frac{1}{2}$ 733
366—6
203|1—6 *d.*
2 |0
101-11-6

Ounces *d.*
$\frac{1}{3}$ 6371 at 5--$\frac{3}{4}$ *per* Ounce.
$\frac{1}{4}$ 2123— 8
$\frac{1}{2}$ 530—11
$\frac{1}{2}$ 265— 5—$\frac{1}{2}$
132— 8—$\frac{3}{4}$
305|2— 9—$\frac{1}{4}$
2 |0
152-12--9—$\frac{1}{4}$

Yards *d.*
$\frac{1}{3}$ 4687 at 6—$\frac{1}{4}$ *per Yard.*
$\frac{1}{2}$ 1562—4
$\frac{1}{8}$ 781—2
97—7—$\frac{3}{4}$
244|1—1—$\frac{3}{4}$
2 |0
122--1-1-—$\frac{3}{4}$

Ounces *d.*
$\frac{1}{2}$ 986 at 7—$\frac{1}{2}$ *per* Ounce.
$\frac{1}{4}$ 493
123—3
61|6—3
2 |0
30-16-3

Quarts. *d.*
½ 9864 at 8—¼ *per Qrt.*

⅓ 4932
⅛ 1644
205— 6

678|1—6
2 |0

339-1—6

Yards *d.*
½ 642 at 9—¾ *per Yard.*

½ 321
¼ 160—-6
40—-1—½

52|1—7—½
2 |0

26-1—7—½

Ounces *d.*
½ 9374 at 10—½ *per Oz.*

½ 4687
½ 2343—-6
1171—-9

820|2—3
2 |0

410-2—3

lb *d.*
⅓ ⅓ 9864 at 11—-¾ *per* lb.

3288
½ 3288
½ 1644
½ 822
½ 411
205 —6

965|8—6
2 |0

482-18-6

Ells *d.*
½ 7897 at 12—¼ *per Ell.*

½ ½ 3948—-6
1974—-3
¹⁄₁₂ 1974—-3
164—-6—¼

806|1—6—¼
2 |0

403-1—6—¼

9876 *Ounces* at 13 *d.* ¼ *per Ounce.*

Anſwer 545 *l.* 4 *s.* 9 *d.*

7897 *Yards* at 1 *s.* 2 *d.* ¾ *per Yard.*

Anſw. 485 *l.* 6 *s.* 8 *d.* ½

7986

7986 *Quarts* at 1 *s.* 3 *d.* ¾ *per Quart.*

Anſw. 524 *l.* 1 *s.* 7 *d.* ½

7579 *Ells* at 4 *s.* 4 *d.* ¼ *per Ell.*

6497 *Yards* at 5 *s.* 4 *d.* ½ *per Yard.*

7986 *Ells* at 2 *s.* 3 *d.* ½ *per Ell.*

Note, That you multiply your two *Shillings* under the given Number, and take the Parts for your three *Pence* in the upper Line. Obſerve the following Queſtion.

```
     Yards   s.  d.
¼    7856 at 3—3—¾ p.Yrd.
        3
    ──────
    23568
¼    1964
      491
    ──────
    2602|3
    2   |0
    ──────
    1301-3
    ──────
```

```
           lb       l.  s.  d.
¼ ¼     98764 at    1—7—6—¼ per lb.
           27       20
     ─────────     ────
       691348      27 Shillings
      197528       ────
     ─────────
      2666628
        24691
  1/12  24691
         2057—-7 d.
     ─────────────
      271806|7—7
      2     |0
     ─────────────
      135903-7—7
     ─────────────
```

The Proof.

```
lb       l.   s.   d.              lb
If 1 ————1—7—6—¼——————98764
         20                  1321
        ———             ————————
         27                 98764
         12                197528
        ————              296292
        330              98764
          4              ——————————
        ————             130467244
       1321              4
        ————             ——————————
                         32616811
                         12
                         ——————————
                          271806|7—7
                          2     |0
                         ——————————
                          135903--7--7
                         ——————————
```

87398 *Ounces* at 2 *l.* 5 *s.* 7 *d.* ¾ *per Ounce.*
Anſwer 191251 *l.* 9 *s.* 6 *d.* ½.

7586 *Butts* at 3 *l.* 10 *s.* 9 *d.* ½ *per Butt.*
Anſwer 26851 *l.* 5 *s.* 7 *d.*

8379 *Hogſheads* at 4 *l.* 6 *s.* 8 *d.* ¼ *per Hogſhead.*
Anſwer, 32834 *l.* 14 *s.* 5 *d.* ½.

The

The Even Parts of a Tun.

C. qrs		
10—0	is the	$\frac{1}{2}$
5—0		$\frac{1}{4}$
4—0		$\frac{1}{5}$
2—2		$\frac{1}{8}$
2—0		$\frac{1}{10}$

The Even Parts of a Hundred-weight.

lb		
16	is the	$\frac{1}{7}$
14		$\frac{1}{8}$

The Even Parts of Half a Hundred-weight.

lb		
14	is the	$\frac{1}{4}$
8		$\frac{1}{7}$
7		$\frac{1}{8}$

The Even Parts of a Quarter of a Hundred-weight.

lb —		
14—0	is the	$\frac{1}{2}$
7—0		$\frac{1}{4}$
4—0		$\frac{1}{7}$
3—$\frac{1}{2}$		$\frac{1}{8}$

C. lb *d.*

25—½—19 at 17 *per Pound.*

4 *Quarters.*

102 *Quarters.*

28 *Pounds.*

825

205

⅓ 2875 *Pounds-weight.*

¼ 958—4

239—7

407|2—11

2|0

203-12-11

The Proof.

If 1 lb———1 *s.* 5 *d.*———25 C. ½ 19 lb.

12 4

17 102

28

825

205

2875

17 Second Number.

20125

2875

48875

12 *Pence.*

407|2—11

2|0

203-12-11

17 C. at 3 *d.* $\frac{1}{4}$ *per Hundred-weight:*
Anſwer 4 *s.* 7 *d.* $\frac{1}{4}$.

97 C. $\frac{1}{2}$ at 2 *l.* 3 *s.* 3 *d.* $\frac{1}{2}$ *per Quarter.*
Anſwer 844 *l.* 3 *s.* 9 *d.*

C. lb
32 *Groſs, Tare* 172 at 7 *d. per Pound Neat.*
112 *Pounds is* 1 *Hundred-weight.*

64
32
32

3584 *Pounds Groſs.*
172 *Pounds Tare.*

$\frac{1}{2}$ 3412 *Pounds Neat.*

$\frac{1}{6}$ 1706
284—4 *d.*

199|0—4
2|0

99-10-4 Anſwer.

C. lb.
56 *Groſs*, *Tare* 17 *per Hundred-weight at* 9 *per*
112 56 *Hundred*. (*Pound Neat*.

112 102
56 85
56

952 *Pounds Tare*.

6272 *Pounds Groſs*.
952 *Pounds Tare*.

½ 5320 *Pounds Neat*.

½ 2660
1330

399|0
2 |0

199—10 Anſwer.

C. lb lb lb
39 *Groſs, Tare* 15 *per* C. and 4 *per* 104 *Tret,* at
112 (4*s.* 6 *d.* per lb *Neat.*

78
39
39

4368 *Pounds Groſs*
585 *Pounds Tare.*

3783 *Pounds Subtle.*
145 *Pounds Tret.*

½ 3638 *Pounds Neat.*
4 *Shillings.*

14552
1819

1637|1
2 |0

818--11 Anſwer.

C.
39 *Groſs.*
15 *Pounds Tare.*

195
39

585 *Pounds Tare.*

lb *Subtle.*
26)3783(145 *Pounds Tret.*
26

118
104

143
130

13

Another Way of finding the Tare.

C. lb d.
56—¼ *Groſs*, *Tare* 16 *per* C. at 10½ *per* lb. *Neat.*
4

225
28

1800
450

1/7 6300 *Pounds Groſs.*
900 *Pounds Tare.*

½ 5400 *Pounds Neat.*

½ 2700
½ 1350
675

472|5
2|0

236—5 Anſwer.

See in the Table what Part of an *Hundred* 16 lb is, I find the 1/7.

47 C. ½ 18 lb. at 7 *s.* 6 *d. per Pound.*
Anſwer, 2001 *l.* 15 *s.*

67 C. ¾ 19 lb. at 5 *s.* 3 *d.* ½ *per Pound.*

987 C. ½ 14 lb. at 1 *l.* 10 *s.* 6 *d. per Pound.*

94 C. ½ 17 lb. *Groſs*, *Tare* 122 at 8 *d.* ¼ *per Pound Neat.*

164 C. $\frac{3}{4}$ 14 lb *Groſs*, *Tare* 22 lb. *per* C. *Tret* 4 lb *per* 104 lb. at 9 *d.* $\frac{1}{4}$ *per Pound Neat.*

174 C. $\frac{1}{2}$ 16 lb. *Groſs*, *Tare* 17 lb. *per* C. *Tret* 4 lb. *per* 104 lb. at 6 *s.* 8 *d.* $\frac{1}{4}$ *per Pound Neat.*

CHAP. X.

The Order of ſubſtracting Tare and Tret.

GROSS is the whole Weight with the *Hogſhead*, *Cheſt*, or whatſoever elſe contains the Commodity.

TARE is the Allowance given for the Weight of *Hogſhead*, *Cheſt*, *&c.* which is ſometimes 14 lb. 16, 20, 24 lb. *per Hundred*, which being ſubſtracted from the *Groſs* Weight, the *Remainder* is called *Neat*, except where there is an Allowance for *Tret*, and then the *Remainder* is called *Subtle*.

TRET is an Allowance of 4 lb. in every 104 lb. on all garbled Goods, or Goods ſold by the *Pound-weight*, ſuch as *Tobacco*, *Indico*, and all Sorts of Spices.

CLOFF is another Allowance of 2 lb. weight, claimed by the Citizens of *London* on every Draft above 3 C. weight on ſome Sort of Goods.

After the *Tret* and *Cloff* is ſubſtracted from the *Subtle*, the *Remainder* is the *Neat* weight.

E X A M P L E.

A Merchant hath 4888 *Pounds-weight* of *Tobacco*, part whereof he bought at a certain Price *per Pound*, and the reſt was allowed him after the Rate of 4 lb. *per* 104 lb. which he bought; the Queſtion is, to know how many *Pounds Neat* he bought?

```
    lb.                lb               lb
If 104 ———————————— 4 —————————————— 4888
                                        4
                                    ————— lb
                              104) 19552 (188 allowed.
                                   104
                                   —————
                                    915
                                    832
                                   —————
  4888 Pounds in all.               832
   188 Pounds allowed.              832
  ————                             —————
  4700 Pounds bought.                00
  ————                             —————
```

A Grocer bought 54 Cheſts of Spice, each 4 C. 2 *qrs.* 14 lb. *Groſs*, *Tare* 21 C. 3 *qrs.* 18 lb. *Tret* 4 lb. *per* 104 lb. what comes the *Neat* Weight to, at 2 *s.* 3 *d.* $\frac{1}{4}$ *per Pound.*

Anſwer 2785 *l.* 19 *s.* 5 *d.* $\frac{1}{4}$.

A Merchant bought 16 *Hogſheads* of *Indico*, each weighing 5 C. 3 *qrs.* 17 lb. *Groſs*, *Tare* 18 C. 2 *qrs.* 19 lb. *Tret* 4 lb. *per* 104 lb. at 17 *d.* $\frac{3}{4}$ *per Pound Neat*, what comes the *Neat-weight* to?

Anſwer, 603 *l.* 8 *s.* 6 *d.* $\frac{1}{4}$.

CHAP. XI.

The Double Rule of Three.

WHEN there are Five Numbers propoſed, then is the Queſtion to be reſolved by the *Double Rule of Three*, and workt by Two *Single Rules of Three.*

Note, That your Firſt and Third Number be both of one Name, that is, if your Firſt Number be *Principal,* the Third muſt be *Principal*; if the Firſt be *Intereſt,* the Third muſt be *Intereſt*; if the Firſt be *Time,* the Third muſt be *Time*; if the Firſt be *Men*, the Third muſt be *Men.*

Of the Five Numbers given, Three imply a Suppoſition, and Two a Demand.

EXAMPLE.

If 8 *Mowers* will mow down 68 *Acres* in 5 *Days*, how many *Mowers* will mow down 434 *Acres* in 10 *Days?*

Note, The Suppoſition is, If 8 *Mowers* mow 68 *Acres* in 5 *Days*; and the Demand is, how many *Mowers* will mow 434 *Acres* in 10 *Days.*

Acres *Mowers* *Acres*

If 68 —— 8 —— 434

8 Second Number.

First Number 68)3472(51 *Mowers.*

340

72

68

4

Days *Mowers* *Days*

If 5 —— 51 —— 10

5 First Number

Last Number 10)255(25 *Mowers* $\frac{1}{2}$

20

55

50

$\frac{5}{10}$ *of a Mower.*

If 750 Horſes in 4 Days do eat 1222 Buſhels of Oats, how many Buſhels will ſerve 1540 Horſes 24 Days?

```
 Horſes        Buſhels         Horſes
If 750 ———————— 1222 ———————— 1540
                              1222  Second Number.
                             ——————
                              3080
                             3080
                            3080
                           1540
                          ———————————
                  75|0)188188|0(2509 Buſhels.
                      150 · · :
                      ————
                       381
                       375
                       ————
                        688
                        675
                        ————
                         13
                        ————

 Days              Buſhels                  Days.
If 4 —————————————— 2509 —————————————————— 24
                      24
                  ——————————
                   10036
                   5018
                  ——————————
                   60216
                   4 Firſt Number.
                  ——————————
                   15054 Buſhels, will 1540 Horſes
                  ——————————     eat in 24 Days
```

If 200 Pioneers in 3 Days caſt a Trench of 350 Rods, how many Rods will 800 Men caſt up in 5 Days?

Anſwer, 2333 *Rods*, $\frac{1}{3}$.

If an Army conſiſting of 7500 Soldiers eat up 2867 Quarters of Wheat in 56 Days, I demand how many Quarters of Wheat will an Army conſiſting of 130000 Soldiers eat in 142 Days?

Anſwer, 126009 *Quarters* $\frac{44}{58}$.

If a Family conſiſting of 9 Perſons drink out 3 Kilderkins of Beer in 15 Days, how many Kilderkins will be drank out in 6 Days by another Family conſiſting of 23 Perſons?

Anſwer 3 *Kild.* 1 *Gall.* $\frac{3}{15}$.

If 100 *l.* in 12 Months gain'd 6 *l.* what Principal was that which gain'd me in 10 Months 38 *l.*

Anſwer, 760 *l.*

If 100 *l.* in 12 Months gain 8 *l.* how much will 355 *l.* 10 *s.* gain me in 7 Months?

Anſwer 16 *l.* 11 *s.* 9 *d.* $\frac{1}{2}$

If 684 Mariners eat 58 Porkers in 14 Days, how many Porkers will 3894 Mariners eat in 26 Days?

Anſwer, 612—$\frac{12}{14}$.

A Man lent a certain Sum of Money, at 6 *l.* *per Cent.* for 5 Years and 6 Months, and at the End of that Term for the Intereſt thereof, received 478 *l.* 10 *s.* I demand what was the Sum lent?

Anſwer, 1450 *l.*

CHAP.

CHAP. XII.

Of FELLOWSHIP.

THERE is no Difference betwixt this *Rule* and the *Rule of Three.*

Add every Man's particular Stock together, the Total muſt be the Firſt Number in the *Rule of Three.*

The *Gain* or *Loſs* muſt be the Second Number.

Every Man's particular Stock muſt be the Third Number.

And the Fourth Number ariſing, is every Man's particular Share of the *Gain* or *Loſs* required.

And by this Rule a Bankrupt's Eſtate is ſhared amongſt his Creditors.

A Gentleman owed to Three ſeveral Perſons 100 *l.* to *A.* 50 *l.* to *B.* 35 *l.* and to *C.* 15 *l.* they employed a Lawyer to get it, and his Bill came to 14 *l.* now the Queſtion is how much every Man ought to pay of the Bill?

	l.
A.	50
B.	35
C.	15

```
                  l.             l.
If 100 l.————————14————————————50
                                14
                               ————
                               200
                               50
                               ————
                         100)700(7 l.
                             700
                             ————
                              00
```

l. l. l.
If 100 —— 14 —— 35
14
140
35
100)490(4 *Pounds.*
400
90
20 *Shillings.*
100)1800(18 *Shil.*
100
800
800
00

l. l. l.
If 100 —— 14 —— 15
14
60
15
100)210(2 *Pounds.*
200
10
20 *Shil.*
100)200(2 *Shil.*
200
00

l.
A. pays 7
B. pays 4—18
C. pays 2— 2
14— 0

Three Merchants made a Company, *A* put in 789 *l.* 10 *s.* *B.* put in 597 *l.* 12 *s.* *C.* put in 1876 *l.* 14 *s.* and they gained 3596 *l.* 11 *s.* I demand each Man's ſhare of the Gains?

	l.	*s.*
A's Share	869—	19—$\frac{53}{85}$
B's Share	658—	10—$\frac{34}{85}$
C's Share	2068—	00—$\frac{42}{85}$
	3596—	11

Five Merchants made a Company, *A.* put in 596 *l.* 10 *s.* *B.* put in 1987 *l.* 11 *s.* *C.* put in 879 *l.* 12 *s.* *D.* put in 469 *l.* 16 *s.* *E.* put in 894 *l.* 14 *s.* and they gained 4987 *l.* 10 *s.* I demand each Man's Share of the Gains?

	l.	*s.*
A's Share	616—	3—$\frac{71651}{96563}$
B's Share	2053—	2—$\frac{92344}{96563}$
C's Share	908—	12—$\frac{59164}{96563}$
D's Share	485—	6—$\frac{10522}{96563}$
E's Share	924—	4—$\frac{56008}{96563}$
	4987—	10

A Ship being in a Tempeſt on the Sea, the Sailors were forced to caſt over Board ſo much of her lading as amounted to 5946 *l.* then its reaſonable that all the Merchants concerned ſhould bear Part of that Loſs according to the Stock he ventured. *A.* ventured 1287 *l.* *B.* ventured 2978 *l.* *C.* ventured 897 *l.* *D.* ventured 1987 *l.* I demand what each Perſon muſt bear of the Loſs?

A's

	l.
A's Part is	$1069 - \frac{600}{7158}$
B's Part is	$2481 - \frac{1764}{7158}$
C's Part is	$745 - \frac{852}{7158}$
D's Part is	$1650 - \frac{4002}{7158}$
	5946

Four Merchants bought a Ship which coſt them 4800 *l.* whereof *A.* muſt pay the $\frac{1}{3}$, *B.* the $\frac{1}{4}$, *C.* the $\frac{1}{5}$, *D.* the $\frac{1}{6}$; the Queſtion is. what every Man muſt pay of the ſaid Sum?

$\frac{1}{3}$ of 60 a ſuppoſed Number.

$\frac{1}{4}$ 20
$\frac{1}{5}$ 15
$\frac{1}{6}$ 12
10

57

	l.
A's Part	$1684 - \frac{12}{57}$
B's Part	$1263 - \frac{9}{57}$
C's Part	$1010 - \frac{30}{57}$
D's Part	$842 - \frac{6}{57}$
	4800

The ſaid Ship made a Voyage to Sea, and hath gotten all Charges and 480 *l.* the Queſtion is, what is each Man's Share of the Gains?

	l.
A's Part	$168 - \frac{24}{57}$
B's Part	$126 - \frac{18}{57}$
C's Part	$101 - \frac{3}{57}$
D's Part	$84 - \frac{12}{57}$
	480

Four Graſiers hired a Piece of Ground for 22 *l.* 12 *s.* *A.* put in 12 Oxen for 16 Days, *B.* put in 24 Oxen for five Days, *C.* put in 15 Oxen for 12 Days, and *D.* put in 18 Oxen for 7 Days, the Queſtion is, how much each Graſier ought to pay.

	Oxen	*Days*	*Product*
A.	12	16	192
B.	24	5	120
C.	15	12	180
D.	18	7	126
			618

Stock and Time	*l.*	*s.*	*Stock and Time*
If 618	22	12	192

20 *Shillings.*

452 *Shillings.*
12 *Pence.*

5434 *Pence.*

Multiply your Second Number under your Third and divide by your Firſt, and the Quotient anſwers in *Pence* what *A.* is to pay for his Share, and ſo work for the reſt.

	l.	*s.*	*d.*	*Parts of a Penny.*
A. pays	7	0	5	$\frac{78}{618}$
B. pays	4	7	9	$\frac{126}{618}$
C. pays	6	11	7	$\frac{498}{618}$
D. pays	4	12	1	$\frac{534}{618}$
Proof	22	12	0	

Remainders
78
126
498
534

618)1236(2 *Pence.*
1236

000

Two Merchants *A.* and *B.* enter into Company, *A.* puts in 800 *l.* and at the End of 5 Months he akes out a Sum, and leaves the reſt to continue Months longer, *B.* puts in 340 *l.* and at 3 Months End he put in 550 *l.* more, and then his whole Sum continues 8 Months longer. At the ballancing of their Accounts, *A.* finds he has gained 210 *l.* and *B.* gained 250 *l.* the Queſtion is, how much *A.* took out of the Stock?

Anſwer, $484\frac{7}{9}$.

Four Men made a Company, and in Proceſs of Time they gained and got by Prizes at Sea 3864 *l.* *A.* put into the Stock 280 *l.* 13 Months, *B.* put in 150 *l.* 17 Months, *C.* put in 180 *l.* 12 Months, *D.* put in 260 *l.* 10 Months; the Queſtion is, what muſt each Man have of the Gains?

Anſwer,
A. muſt have $1284\frac{5160}{10950}$ of a *Pound.*
B. muſt have $899\frac{9150}{10950}$
C. muſt have $762\frac{2340}{10950}$
D. muſt have $917\frac{5250}{10950}$

Proof 3864

CHAP.

CHAP. XIII.

INTEREST.

SIMPLE INTEREST is that which ariſeth from the Principal only, and may be reſolved by the *Single* or *Double Rule of Three.*

Compound-Intereſt is that which ariſeth from the Principal, and alſo from the Intereſt thereof, and is commonly called *Intereſt upon Intereſt.*

If 100*l.* in 12 Months gain 6*l.* what will 500*l.* 10 *s.* gain in the ſame Time ?

```
    l.           l.          l.   s.
If 100 ————————— 6 ————————— 500—10
                                  6
                        ——————————————
                  l. 30 | 03—00
                        |   20
                        ————————
                       0|60
                        |12
                        ————————
                  d.  7 |20
                        | 4
                        ————————
                         80
                        ————————
```

So that 500 *l.* 10 *s.* will gain in 12 Months, at the Rate of 6 *l. per Cent.* 30 *l.* 0 *s.* 7 *d.* See the Work.

If 100 *l.* in 12 Months gain 6 *l.* what will 5 *l.* 12 *s.* 4 *d.* ¼ gain in the ſame Time?

```
  l.              l.              l.   s.   d.
If 100 ————————— 6 ——————————— 5 — 12 — 4 — ¼
   20             20              20
  ————           ————            ————
 2000 Shil.      120 Shil.       112 Shillings.
   12             12              12
  ————           ————            ————
24000 Pence     1440 Pence.     1348 Pence.
    4              4               4
 —————           ————            ————
96000 Farth.    5760 Farth.     5393 Farthings.
 —————           ————             5760 Second Number.
                                 ——————
                                 323580
                                 37751
                                26965
                                ———————
              96000)31063680(323 Farthings.
                    288000 ..     4
                    ——————       ————
                    226368       80—¾
                    192000       12
                    ——————       ————
                    343680       6—8—¾ 55/96
                     288000      ——————————
                     ——————
                      55680
```

So that 5 *l.* 12 *s.* 4 *d.* ¼ lent out at 6 *l. per Cent.* for 12 Months, will gain 6 *s.* 8 *d.* ¾ 55/96 of a *Farthing.*

If 100 *l.* in 12 Months gain 7 *l.* what will 487 *l.* 10 *s.* 8 *d.* gain in the ſame Time.

Anſwer, 34 *l.* 2 *s.* 6 *d.* ½.

If 100 *l.* gain in 12 Months 6 *l.* what will 287 *l.* gain in 2 Years and 8 Months? Anſw. 45 *l.* 18 *s.* 5 *d.*

In the following Table. Seek the Sum deſired, an
even with the ſame, you may find the Intereſt du
for One Month to Twelve, as is there expreſſed, *vi*

Principal Money.	*Intereſt at* 6 per Cent. *for* 500 l. 400 l. &c. *for each Month as followeth.*					
	1 *Month*	2 *Mon.*	3 *Mon*	4 *Mon.*	5 *Mon.*	6 *Mon*
Pounds	l. s. d.	l. s. d	l. s. d.	l. s.d.	l. s. d.	l. s.d
500	2-10-0	5-0-0	7-10-0	10-0-0	12-10-0	15-0-0
400	2-0-0	4-0-0	6-0-0	8-0-0	10-0-0	12-0-0
300	1-10-0	3-0-0	4-10-0	6-0-0	7-10-0	9-0-0
200	1-0-0	2-0-0	3-0-0	4-0-0	5-0-0	6-0-0
100	0-10-0	1-0-0	1-10-0	2-0-0	2-10-0	3-0-0
90	0-9-0	0-18-0	1-7-0	1-16-0	2-5-0	2-14-0
80	0-8-0	0-16-0	1-4-0	1-12-0	2-0-0	2-8-0
70	0-7-0	0-14-0	1-1-0	1-8-0	1-15-0	2-2-0
60	0-6-0	0-12-0	0-18-0	1-4-0	1-10-0	1-16-0
50	0-5-0	0-10-0	0-15-0	1-0-0	1-5-0	1-10-0
40	0-4-0	0-8-0	0-12-0	0-16-0	1-0-0	1-4-0
30	0-3-0	0-6-0	0-9-0	0-12-0	0-15-0	0-18-0
20	0-2-0	0-4-0	0-6-0	0-8-0	0-10-0	0-12-0
10	0-1-0	0-2-0	0-3-0	0-4-0	0-5-0	0-6-0

Intereſt at 6 per Cent. *for* 500 l. 400 l. &c. *is for each Month as followeth.*

Principal Money.	7 *Month*	8 *Mon*	9 *Mon.*	10 *Mon.*	11 *Mon.*	12 *Mon.*
Pounds	l. s. d.	l. s. d.	l. s. d.	l. s. d.	l. s. d.	l. s. d.
500	17 10-0	20-0-0	22-10-0	25-0-0	27-10-0	30-0-0
400	14- 0-0	16-0-0	18- 0-0	20-0-0	22- 0-0	24-0-0
300	10-10-0	12-0-0	13-10-0	15-0-0	16-10-0	18-0-0
200	7- 0-0	8- 0-0	9- 0-0	10-0-0	11- 0-0	12-0-0
100	3-10-0	4- 0-0	4-10-0	5- 0-0	5-10-0	6- 0-0
90	3- 3-0	3-12-0	4- 1-0	4-10-0	4-19-0	5- 8-0
80	2-16-0	3- 4-0	3-12-0	4- 0-0	4- 8-0	4-16-0
70	2- 9-0	2-16-0	3- 3-0	3-10-0	3-17-0	4- 4-0
60	2- 2-0	2- 8-0	2-14-0	3- 0-0	3- 6-0	3-12-0
50	1-15-0	2- 0-0	2- 5-0	2-10-0	2-15-0	3- 0-0
40	1- 8-0	1-12-0	1-16-0	2- 0-0	2- 4-0	2- 8-0
30	1- 1-0	1- 4-0	1- 7-0	1-10-0	1-13-0	1-16-0
20	0-14-0	0-16-0	0-18-0	1- 0-0	1- 2-0	1- 4 0
10	0- 7-0	0- 8-0	0 -9-0	0-10-0	0-11-0	0-12-0

Principal Money.	*Intereſt at 6 per Cent. for 500 l. 400 l. &c is for each Day as followeth.*				
	1 Day.	2 Days.	3 Days.	4 Days.	5 Days.
Pounds	s. d. q.	s. d. q.	s d. q.	s. d. q.	s. d. q.
500	1—8—0	3—4—0	5—0—0	6—8—0	8—4—0
400	1—4—0	2—8—0	4—0—0	5—4—0	6—8—0
300	1—0—0	2—0—0	3—0—0	4—0—0	5—0—0
200	0—8—0	1—4—0	2—0—0	2—8—0	3—4—0
100	0—4—0	0—8—0	1—0—0	1—4—0	1—8—0
90	0—3—½	0—7—0	0-10—¾	1—2—¼	1—6—0
80	0—3—0	0—6—0	0—9—0	1—0—0	1—4—0
70	0—2—¾	0—5—½	0—8—¼	0-11—0	1—2—0
60	0—2—¼	0—4—¾	0—7—0	0—9—½	1—0—0
50	0—2—0	0—4—0	0—6—0	0—8—0	0-10—0
40	0—1—½	0—3—0	0—4—¾	0—6—¼	0—8—0
30	0—1—0	0—2—0	0—3—½	0—4—¾	0—6—0
20	0—0—¾	0—1—½	0—2—¼	0—3—0	0—4—0
10	0—0—¼	0—0—¾	0—1—0	0—1—½	0—2—0

Principal Money.	*Intereſt at* 6 per Cent. *for* 500 l. 400 l. &c. *is for each Day as followeth.*			
	10 *Days.*	20 *Days.*	25 *Days.*	30 *Days.*
Pounds	l. s. d.	l. s. d.	l. s. d.	l. s. d.
500	0-16—8	1-13—4	2—1—8	2-10—0
400	0-13—4	1—6—8	1-13—4	2-0—0
300	0-10—0	1—0—0	1—5—0	1-10—0
200	0—6—8	0-13—4	0-16—8	1—0—0
100	0—3—4	0—6—8	0—8—4	0-10—0
90	0—3—0	0—6—0	0—7-6	0—9-0
80	0—2—8	0—5—4	0—6—8	0—8—0
70	0—2—4	0—4—8	0—5-10	0—7—0
60	0—2—0	0—4—0	0—5—0	0—6—0
50	0—1—8	0—3—4	0—4—2	0—5—0
40	0—1—4	0—2—8	0—3—4	0—4—0
30	0—1—0	0—2—0	0—2—6	0—3—0
20	0—0—8	0—1—4	0—1—8	0—2—0
10	0—0—4	0—0—8	0—0-10	0—1—0

The *Fractions* in this Table (being very ſmall, and but of a *Farthing*,) are omitted.

The Number of Days from every Day in any Month, to the ſame Day in any other.

January	*Februar.*	*March.*	*April.*	*May*	*June.*	*July.*	*Auguſt.*	*Septem.*	*October.*	*Novem.*	*Decemb.*
Feb. 31	Mar 28	Apr. 31	May. 30	Jun. 3	July. 30	Aug. 31	Sep. 31	Oct. 30	Nov. 31	Dec. 30	Jan. 31
Mar 59	Apr. 59	May. 61	Jun. 61	July 61	Aug 61	Sep. 62	Oct. 61	Nov. 61	Dec. 61	Jan. 61	Feb. 62
Apr 90	May. 89	Jun. 92	July. 91	Aug. 92	Sep 92	Oct 92	Nov. 92	Dec. 91	Jan. 92	Feb. 92	Mar. 90
May 120	Jun 120	Jul. 122	Au. 122	Sep. 123	Oct. 122	Nov. 23	Dec. 122	Jan 122	Feb. 123	Mar 120	Apr 121
Jun 151	Jul. 150	Au. 153	Sep. 153	Oct. 153	Nov 153	Dec. 153	Jan 153	Feb. 153	Mar 151	Apr 151	May 151
Jul. 181	Au. 181	Sep. 184	Oct. 183	Nov 184	Dec. 183	Jan 184	Feb. 184	Mar 181	Apr 182	May 181	Jun 182
Au. 212	Sep. 212	Oct. 214	Nov 214	Dec. 214	Jan 214	Feb. 215	Mar 212	Apr 212	May 212	Jun 212	Jul. 212
Sep. 243	Oct. 242	Nov 245	Dec. 244	Jan 245	Feb. 245	Mar 243	Apr 243	May 242	Jun 243	Jul. 242	Au. 243
Oct 273	Nov 273	Dec 275	Jan 275	Feb. 276	Mar 273	Apr 274	May 273	Jun 273	Jul. 273	Au. 273	Sep. 274
Nov 304	Dec. 303	Jan 306	Feb. 376	Mar 304	Apr 304	May 304	Jun 304	Jul 303	Au. 304	Sep. 304	Oct 304
Dec. 334	Jan 334	Feb. 337	Mar 334	Apr 335	May 334	Jun 335	Jul. 334	Au. 334	Sep 335	Oct. 334	Nov 335

This Table ſhews you to find out any Number of Days under a Year from one Month to another thus: Find the Firſt Month in the Top, and the Second in the ſame Column.
Example.

	June		*March*		*Days.*
From	3	to	3	is	273

In-

Intereſt upon Intereſt.

I demand the *Intereſt* of 374 *l.* lent out for 2 Years and 6 Months after 6 *l. per Cent. per Annum*, *Intereſt* upon *Intereſt.*

l. *l.* *l.*
If 100 ———— 6 ———— 374
6
22|44
20 *Shillings.*
8|80
12 *Pence.*
9|60
4 *Farthings*
2|40

l.
374 *Money lent*
1ſt *Years* 22—8—9—½ *Intereſt.*
396—8—9—½

l. *l.* *l.* *s.* *d.*
If 100 ———— 6 ———— 396—8—9—½
6
23|78—12—9—0
20
15|72
12
8|73
4
2|92

l. *s.* *d.*
396— 8—9—½ *Int. and Prin.*
2d *Years* 23—15—8—½ *Intereſt.*
420—04—6—0

```
   l.               l.                l.     s. d
If 100 —————————————3 ————————————— 420— 4—6
                                           3
                                   ———————————
                                   12|60—13—6
                                     | 20
                                    ————
                                   12|13
                                     |12
                                    ————
                                    1|62
                                     | 4
                                    ————
                                    2|48
                                    ————
```

```
              l.    s.   d.
              420— 4—6       Principal and Intereſt.
6 Months      12—12—1 ½      Intereſt.
              ———————————
              432—16—7—½
              ———————————
```

So that you find by the Work, That at the End of Two Years and Six Months 432 *l.* 16 *s.* 7 *d.* ½ was paid in.

28 *l.* 18 *s.* 6 *d.* let out at 6 *l.* *per Cent.* for 9 Months and 5 Days, and paid in at the End of 2 Years, 5 Months, and 4 Days 6 *l.* 17 *s.* 9 *d.* and after 7 Months and 3 Days the Remainder was paid in, I demand what was the Sum paid in with *Intereſt* upon *Intereſt*?

Firſt Stating.

```
                       l.   s.   d.                  Mon. Days
Days
If 365 ————————————  1—14—8—½ ———————————————  9—5
                     20                         30
                     ——                        ———
                     34                        275
                     12                        ———
                     ——
                    416
                      4
                   ————
                   1666
                    275
                   ————
                   8330
                 11662
                 3332
                 ——————
            365)458150(1255
                365    4
                ———   ——————
                931    313—3
                730    12
                ———   ——————
               2015    2|6—1
               1825    2|0
               ————   ————————————
               1900    1—6—1—¾
               1825   ————————————
               ————
                 75
                 ——
```

Second Stating.

l. l. l. s. d.

If 100 ——— 6 ——— 30—4—7—$\frac{3}{4}$

6

1|81—7—10—$\frac{1}{2}$

20

16|27

12

3|34

4

1|38

Third Stating.

l. l. l. s. d.

If 100 ——— 6 ——— 32—0—11

6

1|92—05—6

20

18|45

12

5|46

4

1|84

Fourth

Fourth Stating.

```
Days              l.  s.  d.               Mon. Day
If 365 ————————— 2 — 0 — 9 ——————————————— 5 — 4
                 20                          30
                 ——                          ——
                 40                         154
                 12
                 ———
                 489
                   4
                ————
                1956
                 154
                ————
                7824
               9780
              1956
              ——————
      365)301224(825
            2920  4
            ————  ————
             922  206—1/4
             730  12
             ———  ————————
            1924   17—2—1/4
            1825   ————————
            ————
              99
             ———
```

Fifth Stating.

```
 Days              l.  s.  d.                 Mon.Day.
If 365 ———————— 1—13—6—1/4 ——————————————— 7—3
                   20                          30
                  ————                        ————
                   33                          213
                   12                         ————
                  ————
                  402
                    4
                 —————
                 1609
                  213
                 —————
                 4827
                1609
               3218
               ——————
          365)342717(938 Farthings.
              3285    4
              ————   —————
              1421   234—2
              1095   12
              ————   ——————
              3267   19—6—1/2
              2920   ——————
              ————
               347
              ————
```

Adding

Adding of Principal and Intereſt.

l.	*s.*	*d.*	
28	18	6	*Principal.*
1	6	1—¾	*Intereſt for the 9 Months and 5 Days.*
30	4	7—¾	*Principal and Intereſt.*
1	16	3—¼	*Intereſt for the Firſt Year.*
32	0	11—0	*Principal and Intereſt.*
1	18	5—¼	*Intereſt for the Second Year.*
33	19	4—¼	*Principal and Intereſt.*
	17	2—¼	*Intereſt for Five Months Four Days.*
34	16	6—½	*Principal and Intereſt.*
6	17	—0	*Firſt Payment. Subſtract.*
27	18	9—½	*Remains.*
	19	6—½	*Intereſt for Seven Months Three Days.*
28	18	4—0	*The Principal and Intereſt paid in.*

March the 15th, 1697. lent 59 *l.* 15 *s.* 6 *d.* at 7 *l. per Cent. per Annum*, for 3 Years, 3 Months, and 5 Days, *Intereſt* upon *Intereſt*, and paid in 17 *l.* 11 *s.* 9 *d.* the 17th of *January*, and *July* the 19th 1701. paid more 12 *l.* 17 *s.* 9 *d.* and *March* the 28th, 1702. paid more 7 *l.* 9 *s.* and *March* the 26th, 1703. the whole Sum was paid in. I demand the Intereſt and Principal paid in.

Anſwer, 47 *l.* 19 *s.* 3 *d.* ¼ *Principal* and *Intereſt* paid in.

A Table to find out what any Sum of Money will amount unto for 31 *Years or under, at* 6 l. per Cent. Intereſt *upon Intereſt.*

Years	*l.*	*s.*	*d.*
1	1—	1—	2—$\frac{1}{4}$
2	1—	2—	5—$\frac{1}{2}$
3	1—	3—	9—$\frac{3}{4}$
4	1—	5—	3—
5	1—	6—	9—
6	1—	8—	4—$\frac{1}{4}$
7	1—	10—	0—$\frac{3}{4}$
8	1—	11—	10—$\frac{1}{2}$
9	1—	13—	9—$\frac{1}{4}$
10	1—	15—	9—$\frac{3}{4}$
11	1—	17—	11—$\frac{1}{2}$
12	2—	0—	2—$\frac{3}{4}$
13	2—	2—	7—$\frac{3}{4}$
14	2—	5—	2—$\frac{1}{2}$
15	2—	7—	11—
16	2—	10—	9—$\frac{1}{2}$
17	2—	13—	10—
18	2—	17—	0—$\frac{3}{4}$
19	3—	0—	5—$\frac{3}{4}$
20	3—	4—	1—$\frac{1}{2}$
21	3—	7—	11—$\frac{1}{2}$
22	3—	12—	0—$\frac{1}{2}$
23	3—	16—	4—$\frac{1}{2}$
24	4—	0—	11—$\frac{1}{2}$
25	4—	5—	9—$\frac{3}{4}$
26	4—	10—	11—$\frac{1}{2}$
27	4—	16—	5—
28	5—	2—	2—$\frac{1}{2}$
29	5—	8—	4—
30	5—	14—	10—
31	6—	1—	8—$\frac{1}{2}$

The Uſe of this Table.

I demand what 60 *l.* comes to, *Intereſt* upon *Intereſt* for 12 Years. Look againſt Number 12 in the firſt Column, and you will find what the *Intereſt* upon *Intereſt* of 1 *l.* comes to in that Time; then ſay by the *Rule of Three.*

l. — *l. s. d.* — *l.*
If 1 —— 2—0—2—$\frac{3}{4}$ —— 60
20
40
12
482
4
1931
60
115860
4
28965
12
241 | 3—9
2 | 0
Anſw. 12—13—9

Suppoſe a Man puts out 150 *l.* at *Intereſt* upon *Intereſt* for 21 Years to portion his Daughter, the Time being expired, what has the Maid for her Portion?

Anſwer, 509 *l.* 13 *s.* 9 *d.*

A very uſeful Table to find out the preſent worth of the Annuity or Yearly Rent for 21 *Years or under, after the Rate of* 6 l. per Cent. per Annum.

Years	*l.*	*s.*	*d.*
1	0	18	10 ½
2	1	16	8
3	2	13	5 ½
4	3	9	3 ½
5	4	4	2 ¾
6	4	18	4
7	5	11	7 ¾
8	6	4	2 ½
9	6	16	0 ½
10	7	7	2 ½
11	7	17	9
12	8	7	8
13	8	17	0 ½
14	9	5	11
15	9	14	2 ¾
16	10	2	1 ¼
17	10	9	6 ½
18	10	16	6 ¼
19	11	3	1 ¾
20	11	9	4 ¾
21	11	15	3 ¼

I deſire to know what 1 *l.* Yearly Rent is worth for 16 Years in ready Money. Look againſt Number 16 in the firſt Column, and you'll find 1 *l.* for 16 Years, is worth 10 *l.* 2 *s.* 1 *d.* ¼.

Then to know what any other Number is worth for the ſame Time; ſay by the *Rule of Three*,

l. *l.* *s.* *d.* *l.*
If 1 —— 10—2—1—¼ —— 125
Anſwer 1263 *l.* 3 *s.* 0 *d.* ¼.

What is 8 *l.* *per Annum* worth in ready Money for 8 Years and ½.

Look in the Table for 8 and you'll find 6 *l.* 4 *s.* 2 *d.* ½ then ſey by the *Rule of Three.*

l. *l.* *s.* *d.* *l.*
If 1 be worth ——6—4—2—½—— what will 8
Anſwer, 49 *l.* 13 *s.* 8 *d.*

Now to find the Half-Years worth, ſee what 1 *l.* is worth for 9 Years; then ſay by the *Rule of Three.*

l. ——— *l.* *s.* *d.* ——— *l.*
If 1 ——— 6—16—0—½ ——— 8

l. *s.* *d.*
Anſwer, 54— 8—4
Now ſubſtract 49—13—8

4—14—8 Remains for 1 Year.

The Half is 2—7—4 The Value for one Half-Year, which add to the 8 Years Value, and the *Product* is the Demand: *viz.* 52 *l.* 1 *s.*

CHAP. XIV.

REBATE or DISCOUNT.

IS that when a Sum of Money due at any Time to come, is ſatisfied by the Payment of ſuch preſent Money, as being put forth at a certain Rate of Intereſt for the ſaid Time, would become equal to the Sum firſt due.

Note, The Firſt Number is 12 Months.

The Second Number is the Intereſt.

The Third Number is the Time propoſed.

A Merchant ſold a Parcel of Jewels to the Value of 679 *l.* 10 *s.* 8 *d.* to another, to be paid at 13 Months, 18 Days, but the other is willing to pay preſent Money upon rebate after 8 *l. per Cent. per Annum.*

EXAMPLE.

Months	*l.*	*Mon. Days.*
If 12	8	13—18
30		30 *Days.*
365		408 *Days.*

8

365)3264(8 *Pounds.*
2920

344
20

365)6880(18 *Shillin.*
365

3230
2920

310
12

365)3720(10 *Pence.*
365

70
4

$\frac{280}{365}$ *of a Farthin.*

Then ſay, If 108 *l.* 18 *s.* 10 *d.* abate 8 *l.* 18 *s.* 10 *d.* what ſhall the given Sum abate? The *Quotient* will ſhew the Rebate, which being ſubſtracted out of the given Sum, ſheweth the Money to be paid preſently.

EXAMPLE.

l. *s.* *d.* — *l* *s.* *d.* — *l.* *s.* *d.*
If 108-18-10 —— 8-18-10 —————— 679-10-8
20 — 20 — 2
2178 — 178 — 13590
12 — 12 — 12
26146 — 2146 — 163088

2146
978528
652352
163088
326176
26146)349986848(13385 *d.*
26146 . . . — 12
88526 — 111|5-5
78438 — 2 |0
100888 — 55-15 5
78438
224504
209168
153368
130730
22638

l. *s.* *d.*
Was to be paid 679—10—8
Is to be paid 623—15—3
Is rebated 55—15—5

A

A Merchant ſells Goods for 324 *l.* for 2, 5 Months, the Perſon buying will pay preſent Money; I demand the Diſcount after the Rate of 6 *l. per Cent.*

By 2, 5 Months is to be underſtood, the ½ of the Money is to be paid at 5 Months, and the other ½ 5 Months after that.

```
    Mon.   l.   Mon.
 If 12 —— 6 —— 10
                6
              ----
               60
               12
              ----
               5 Pounds.
              ----

     l.   s.            l.  s.              l.
 If 102 — 10 ——————— 2 — 10 ——————————— 162
       20                20                  20
     ----              ----               -----
     2050                50                3240
     ----              ----                  50
                                          -----
                                2050)162000(7|9
                                     14350  2|0
                                     -----  ----
                                     18500  3-19
                                     18450  ----
                                     -----
                                        50
                                     -----
```

	l.	*s.*	
Was to be paid	162 —	0	Firſt 5 Months.
Is to be paid	158 —	1	
Is rebated	3 —	19	

If

l. l. l.
If 105 ———— 5 ———— 162
5

105)810(7 Pounds.
735

75
20

105)1500(14 Shill.
105

450
420

30
12

105)360(3 Pence.
315

45
4

105)180(1 Farth.
105

75

l. s. d.
Was to be paid 162—0—0
Is to be paid 154—5—8—$\frac{3}{4}$

Is rebated 7-14—3—$\frac{1}{4}$

A Merchant ſold Goods to the Value of 250 *l.* to be paid at 8 Months, how much ought the Buyer to pay preſent, rebating 6 *l* *per Cent*.

Anſwer, 240 *l.* 7 *s.* 8 *d.* $\frac{1}{2}$.

A

A Merchant ſold 5 Butts of Currants of Weight and Price, *viz.*

			C.		lb.		lb.
No.	1	Groſs	9	$\frac{1}{2}$	16	Tare	95
	2	——	8	$\frac{1}{4}$	24	——	76
	3	——	7	$\frac{3}{4}$	18	——	84
	4	——	9	$\frac{1}{2}$	25	——	96
	5	——	8	$\frac{3}{4}$	14	——	90

At 42 *s. per* C. weight Neat, to be paid at 16 Months, but the Buyer is willing to pay preſent Money, rebating 7 *l. per Cent.* Anſw. 78 *l.* 2 *s.* 3 *d.*

CHAP. XV.

A Collection of Queſtions for the Learners Practice.

A Merchant bought 146 Pieces of Broad-Cloth at 8 *l.* 11 *s.* 9 *d. per* Piece, each Piece containing 29 Yards, which he ſhip'd for *Spain*, to have returned from thence:

VIZ.

$\frac{1}{5}$ in *Spaniſh* Tobacco at 6 *s.* 8 *d. per Pound.*
$\frac{1}{5}$ in *Malaga* Raiſins, 1 *l.* 17 *s.* 8 *d. per C. weight.*
$\frac{1}{5}$ in Raiſins of the Sun, at 2 *l.* 5 *s.* 9 *d. per C. wt.*
$\frac{1}{5}$ *Canary* Wine, at 8 *d.* $\frac{1}{4}$ *per Pint.*
$\frac{1}{5}$ in *Malaga* Sack, at 9 *d.* $\frac{1}{2}$ *per Pint.*

I demand how much of each Sort he had according to the Tenure of the Queſtion?

Anſwer,
6 C. 2 *qrs.* 24 lb. 4 *oz.* $\frac{16}{80}$ Tobacco.
6 *Tun.* 13 C. 0 *qrs.* 16 lb. $\frac{48}{452}$ *Malaga* Raiſins.
5 *Tun.* 9 C. 2 *qrs* 13 lb. $\frac{199}{549}$ Raiſins of the Sun.
3 *T.* 2 *Hogſh.* 29 *Gal.* 1 *Pot.* 1 *Qt.* 0 *Pt.* $\frac{22}{32}$ *Canary.*
3 *T.* 0 *Hogſh.* 35 *Gal.* 1 *Po.* 1 *Qt.* 0 *Pt.* $\frac{32}{38}$ *Malaga* Sack.

A Man died, left his Wife big with Child, and his Legacy was 500 *Pounds*, he left it after this Manner; *viz.* That if ſhe had a Son, then the Son ſhould have the $\frac{2}{3}$ and the Mother the $\frac{1}{3}$, but if ſhe had a Daughter, then the Mother ſhould have the $\frac{2}{3}$, and the Daughter the $\frac{1}{3}$ of the Legacy, but ſhe brought forth Son and Daughter; the Queſtion is, what each of them muſt have according to the Teſtator's Will?

EXAMPLE.

1
2
3
———

If 6 ——— *l.* 500 ——— 1
6
———
83—$\frac{2}{6}$
———

If 6 ——— *l.* 500 ——— 2
2
———
1000
6
———
166—$\frac{4}{6}$

If 6 ——— *l.* 500 ——— 3
3
———
1500
6
———

250 ***Son's Share.***
166—$\frac{4}{6}$ ***Mother's Share.***
83—$\frac{2}{6}$ ***Daughter's Share.***
———
L. 500

A General hath 10000 Men, and he would place 185 Men in a File, he is deſirous to know how many Ranks he may make?

Anſwer 54—$\frac{10}{185}$.

If 7 Woodcocks and 5 Partridges coſt 8 *s.* 8 *d.* reckon 3 *Partridges* to coſt as much as 1 Woodcock, what is the Price of each Bird?

Anſwer, 4 *d. the Price of a Partridge.*

A Footman goeth 28 Miles a Day (the artificial Day being 12 Hours) from *York* to *Norwich.* A Horſman is ſent after him, and taketh his Journey 4 Days after the Footman and travelleth 45 Miles a Day, in what Time will he overtake the Footman.

Anſwer, 6 *Days,* 7 *Hours,* $\frac{1}{17}$.

There is a Ciſtern hath 3 Cocks, the firſt Cock will empty the Ciſtern in the $\frac{1}{4}$ of an Hour, the other in the $\frac{1}{2}$ of an Hour, and the third in $\frac{3}{4}$ of an Hour; in how long Time will all the three Cocks, if ſet open, empty this Ciſtern?

E X A M P L E.

	Minutes
$\frac{1}{4}$ of an *Hour* is	15
$\frac{1}{2}$ of an *Hour* is	30
$\frac{3}{4}$ of an *Hour* is	45

Minutes — *Ciſtern* — *Minutes*

If 15 ———— 1 ———— 60

15)60(4 *Ciſterns.*

60

0

Minutes — *Ciſtern* — *Minutes*

If 30 ———— 1 ———— 60

30)60(2 *Ciſterns.*

60

0

If

Minutes *Ciſtern* *Minutes*

If 45 ——— 1 ——— 60

45)45(1 *Ciſtern* $\frac{1}{3}$

$\frac{15}{45}$ or $\frac{1}{3}$

So that 7 Ciſterns and the $\frac{1}{3}$ may be emptied in an Hour; therefore, one Ciſtern in the $\frac{1}{7}$ and $\frac{1}{3}$ of $\frac{1}{7}$ of an Hour, reduce the $\frac{1}{7}$ and the $\frac{1}{3}$ of $\frac{1}{7}$, *facit* 28, and the $\frac{1}{3}$ of $\frac{1}{7}$ is 21, and $\frac{1}{7}$ is 147; ſo that it is $\frac{28}{147}$ of 60 Minutes, thus:

If 147 ——— 28 ——— 60

28

480

120

147)1680(11 *Minutes* $\frac{63}{147}$ *of a Minute*

147

210

147

$\frac{63}{147}$ *of a Minute.*

So that if all the Cocks be ſet open at once, the Ciſtern will be emptied in 11 *Minutes*, $\frac{63}{147}$ *of a Minute.*

A Woman bought 100 of Oranges at 2 a *Penny*, and 100 at 3 a *Penny*, and ſold them again 5 for *Twopence*, how much did ſhe gain or loſe. Anſw. 3 *d.* $\frac{1}{4}$.

The Cock of a Conduit running into a Ciſtern, filleth it in 5 Hours, this Ciſtern hath a Cock will empty the Ciſtern in 17 Hours; in what Time will the Ciſtern be full when both Cocks are ſet open at once. Anſwer 7 *Hours*, 5 *Minutes.*

There was a Legacy left of 160 *Pound* given in *Shillings*, *Sixpences*, *Groats*, and *Threepences*, how many poor People will it equally relieve, that there be no more of one Sort than another?

Anſwer, 1536 *poor People of each Sort.*

The Iron-Work that goes round the *Cupola* in St. *Paul's* Church, being in Number 130 Pieces, each weighing 8 C. 0 *qrs.* 15 lb. it being the Work of 7 Men for 26 Weeks, and each Man's Wages 20 *s. per* Week, and ſuppoſing the Iron to be worth 1 *s. per* Pound when it is fixed; I demand how much the whole comes to, and what the Workmens Wages is, and likewiſe what the Undertaker gains by the Work, allowing that the Iron and painting of it ſtands him in 5 *d. per* Pound?

Anſwer,

	l.	*s.*	*d.*
The Whole comes to	5921	10	0
Iron and Painting	2467	5	10
Workmens Wages	182	0	0
	2649	5	10
	l.	*s.*	*d.*
	5921	10	0
	2649	5	10
Gains	3272	4	2

A Ciſtern containing 1980 Gallons, hath 3 Cocks continually running, the firſt Cock runs out 30 Gallons in an Hour, the ſecond 18 Gallons, and the third 12 Gallons; in how long Time will the Ciſtern be emptied, ſetting all the Cocks open?

Anſwer, 1 *Day*, 9 *Hours.*

A Nobleman dying, left 10000 *l.* to be diſtributed amongſt unbeneficed Miniſters, poor deſerving Gentlemen, and decay'd Tradeſmen, 40 Miniſters were to have 10 *l.* to the Gentlemens 5 *l.* 50 Gentlemen were to have 5 *l.* to the Tradeſmens 1 *l.* 60 Tradeſmen were likewiſe to have their Share of the Legacy ; I demand what will the Miniſters, Gentlemens, and Tradeſmens Shares be, and how many of each Sort it will relieve, according to the Teſtator's Will ?

		l.	*s*	*d.*
Anſwer,	400 Miniſters	5633—	16—	0—$\frac{1}{2}$ $\frac{50}{71}$
	250 Gentlemen	3521—	2—	6—$\frac{1}{4}$ $\frac{49}{71}$
	60 Tradeſmen	845—	1—	4—$\frac{3}{4}$ $\frac{43}{71}$
	Proof	10000—	0—	0—0

A Man hath 3 Sons, amongſt which he left 1000 *l.* to be divided as followeth, the Eldeſt Son to have 4 *l.* the Second 2 *l.* and for the Youngeſt 1 *l.* how much muſt each Son have of the Father's Eſtate?

		l.	*s.*	*d.*
Anſwer,	Eldeſt Son	571—	8—	6—$\frac{3}{4}$ $\frac{3}{7}$
	Second Son	285—	14—	3—$\frac{1}{4}$ $\frac{5}{7}$
	Third Son	142—	17—	1—$\frac{1}{2}$ $\frac{6}{7}$
	Proof	1000—	0—	0—0

A Conduit hath a Cock which running into a Ciſtern will fill it in 10 Minutes, this Ciſtern hath 3 Cocks, one before and one on each Side. That Cock before, will empty the Ciſtern in an Hour, and that on the Right Side will empty in $\frac{3}{4}$ of an Hour, and that on the Left Side, will empty the Ciſtern in $\frac{1}{2}$ an Hour. In how long Time will the Ciſtern be filled ſetting all the Cocks open ?

Anſwer, 36 *Minutes.*

A rich Man dying, left 10000 *Pounds* to be diſtributed as followeth, *viz.*

$\frac{3}{4}$ to the beautifying of *Exeter-College* in *Oxford*.
$\frac{2}{3}$ to *Trinity-College* in *Cambridge*, and the
$\frac{3}{5}$ to *Chelſea-College*. How much muſt each of them have?

		l.
Anſwer,	*Exeter-College* muſt have	3719 $\frac{1}{121}$
	Trinity-College muſt have	3305 $\frac{95}{121}$
	Chelſea-College muſt have	2975 $\frac{25}{121}$
	Proof	10000

A General going to view the Camp, gave to an Officer 20 *Guineas* to be diſtributed among 500 Soldiers, the *Fraction* or *Remainder* of every Soldier's Proportion the Officer was to have, I demand each Soldier's Share, and what the Officer had?

		s.	*d.*	
Anſwer,	Each Soldier had	0	10	$\frac{1}{4}$
	Officer had	2	11	0

A Drover driving Sheep, was asked were he was going with thoſe Score of Sheep, anſwer'd, there is not a Score, for I want as many more, and half as many more, and 2 Sheep and $\frac{1}{2}$ to make the Number of them a Score; I demand how many Sheep the Drover had when he made that Anſwer?

Anſwer, 7.

A Ciſtern containing 5170 Gallons having 4 Cocks, runs out, *viz.*

1ſt Cock	15 Gallons	in an Hour.
2d Cock	19 Gallons	
3d Cock	10 Gallons	
4th Cock	6 Gallons	

In how long Time will this Ciſtern be emptied, when a Fifth Cock runs into the Ciſtern 24 Gallons in an Hour? Anſw. 8 *Days*, 6 *Hours*; 50 *Min.* $\frac{10}{13}$.

There was at Supper a Knight, a Gentleman, and a Tradeſman, they ſpent 20 *Shillings*, the Knight would pay the $\frac{1}{2}$, the Gentleman the $\frac{1}{3}$, and the Tradeſman the $\frac{1}{4}$, what muſt every Man pay of this Reckoning?

		s.	*d.*		
Anſwer,	Knight's Share	9	2	$\frac{3}{4}$	$\frac{1}{13}$
	Gentleman's Share	6	1	$\frac{3}{4}$	$\frac{5}{13}$
	Tradeſman's Share	4	7	$\frac{1}{4}$	$\frac{7}{13}$
	Proof	20	0	0	

A Merchant left his Wife big with Child, and by Will bequeathed his Goods, which amounted to 2600 *Pounds*, thus, That if his Wife was delivered of a Female Child, then ſhe ſhould have $\frac{2}{3}$ and the Daughter the $\frac{1}{3}$, but if ſhe ſhould bring forth a Male Child, then he ſhould have the $\frac{2}{3}$ and the Mother the $\frac{1}{3}$; but it happened that the Mother was delivered of two Boys and a Girl, how ſhall the Legacy be diſtributed according to the Teſtator's Will?

		l.	*s.*	*d.*		
Anſwer,	Sons Share	945	9	1	0	$\frac{4}{11}$
		945	9	1	0	$\frac{4}{11}$
	Mother's Share	472	14	6	$\frac{1}{2}$	$\frac{2}{11}$
	Daughter's Share	236	7	3	$\frac{1}{4}$	$\frac{1}{11}$
	Proof	2600	0	0	0	

Suppoſe a Dog, a Wolf, and a Lion, were to devour a Sheep, and the Dog could eat up the Sheep in an Hour, the Wolf in $\frac{3}{4}$, and the Lion in $\frac{1}{2}$ of an Hour. Now if the Lion begin to eat the $\frac{1}{8}$ of an Hour before the other Two, and afterward all Three eat together; the Queſtion is, in what Time the Sheep will be devoured?

Anſwer, $\frac{31}{104}$ *of an Hour.*

CHAP.

CHAP. XVI.

Notation of DECIMALS.

I Shall ſhew you the Uſe of *Decimal Fractions* in all the Rules of *Arithmetick*, but principally in the ſolving Queſtions of *Intereſt* and *Rebate*, according to the ſeveral Rates of *Intereſt*, both *Simple* and *Compound*, with the true Valuation of Leaſes and Annuities, either preſent or in Reverſion, and likewiſe their Uſe in calculating Tables for that Purpoſe, &c.

Now that the Nature of a *Decimal Fraction* may be conceived, imagine a Foot Rule to be divided into 10 equal Parts, each Diviſion will be $\frac{1}{10}$, then imagine every of thoſe Tenths to be divided into 10 equal Parts, then a Foot will be divided into an 100 equal Parts, every firſt Diviſion will be $\frac{1}{10}$ or $\frac{10}{100}$, and every ſecond Diviſion (in reſpect to the whole) will be $\frac{1}{100}$, ſo that if 3 Tenths and a Half were to be expreſt, it's $\frac{35}{100}$; by this Means, an *Hour*, a C. a *Pound*, a *Shilling*, *&c.* may be divided into 10, 100, 1000, 10000, *&c.* equal Parts at Pleaſure.

Reduction of Decimals.

To reduce a given Vulgar Fraction *to a* Decimal, *that ſhall be equivalent thereto.*

When in any Arithmetical Operation your Work is ſo mingled with *Vulgar Fractions*, as to render it tedious or difficult, the beſt Remedy you can have, is to reduce your *Vulgar Fraction* or *Fractions* into a

Decimal or *Decimals*, which having done, the Work will be as eaſie in every reſpect, as if you had to do with nothing but whole Numbers, which you may effect by the following Proportion, *viz.* as the *Denominator* of the given *Vulgar Fraction* is to its *Numerator*, ſo is an Unit with ſo many Cyphers as you intend your *Decimal* ſhall have Places, to the *Decimal* required.

So if the *Fraction* to be reduced were $\frac{3}{4}$, and you would reduce it to a *Decimal* conſiſting of 4 Places, I ſay the Proportion is

As 4 (the *Denominator* of the given Fraction.)
Is to 3 (its *Numerator*.)
So is 10000 (the *Denominator* of the *Decimal* required)
To 7500. (the *Decimal* required.)

So that I conclude, $\frac{3}{4}$ will be reduced to its equivalent *Decimal* .7500 or .75 for Cyphers on the right Hand of a *Decimal*, do neither increaſe nor diminiſh its Value.

Now according to the aforeſaid Proportion it is evident, That if to the *Numerator* of any *Fraction* given to be reduced to a *Decimal*, you annex as many Cyphers as you intend its equivalent *Decimal* ſhall have Places, and divide it by its *Denominator*, the *Quotient* will be the *Decimal* required. See the Work of the former *Fraction*.

```
Denominator     Numerator     Decimal
  4 ————————————— 3 ————————— 10000
                                  3
                          ——————————
                          4)30000(.7500
                             28
                          ———————
                             20
                             20
                          ————————
                              00
                              00
                            ——————
                               00
                               00
```

the *Decimal* ſought, or .75, or which is all one, $\frac{3}{4}$ of 100, or of 20 *s.* is 15 *s.*

What is the $\frac{1}{8}$ in a *Decimal Fraction*?

Denominator	*Numerator*	*Decimal*
8	1	1000

Anſw. .125 the *Decimal* ſought.

Here followeth the Decimal Tables in Reduction.

Of *Engliſh* Money, the *Integer* being a *Pound.*

Shillings.	*Decimal.of a* l.
19	.95
18	.9
17	.85
16	.8
15	.75
14	.7
13	.65
12	.9
11	.55
10	.5
9	.45
8	.4
7	.35
6	.3
5	.25
4	.2
3	.15
2	.1
1	.05

Pence with Farthings.	*Decimal.of a* l
	.0489583
d	.0479166
	.046875
11	.0458333
	.0447916
	.04375
	.0427082
10	.0416666
	.040625
	.0395833
	.0385416
9	.0375
	.0364583
	.0354166
	.034375
8	.0333333
	.03229 6
	.03125
	.0302083
7	.0291666
	.028125
	.0270833
	.0260416
6	.025
	.0239583
	.0229166
	.021875
5	.0208333
	.0197916
	.01875
	.0177708
4	.0166666
	.015625
	.0145833
	.0135416

Pence, Farth.	*Decimal of a* l.
3	.0125
	.0114583
	.0104166
	.009375
2	.0083333
	.0072916
	.00625
1 *Penny* 1 *Far.*	.0052083
1	.0041666
3 *Farthings*	.003125
2 *Ditto*	.0020833
1 *Ditto.*	.0010416

Of *Troy-Weight*, the *Integers* being an *Ounce.*

Pennyweights	*Dec. of an* Oz.
19	.95
18	.9
17	.85
16	.8
15	.75
14	.7
13	.65
12	.6
11	.55
10	.5
9	.45
8	.4
7	.35
6	3
5	.25
4	.2
3	.15
2	.1
1	.05

Grains	*Dec. of an* Oz.
23	.0479166
22	.0458333
21	.04375
20	.0416666
19	.0395833
18	.0375
17	.0354166
16	.0333333
15	.03125
14	.0291666
13	.0270833
12	.025
11	.0229166
10	.0208333
9	.01875

Grains	*Dec. of an* Oz.
8	.0166666
7	.0145833
6	.0125
5	.0104166
4	.0083333
3	.00625
2	.0041666
1	.0020833

Averdupoize great Weight, the *Integer* being an *Hundredweight*, to wit, 112 lb.

Quarters of 1 *Hundred.*	*Decimals of* 1 *Hundred.*
3	.75
2	.5
1	.25

Pounds

Pounds	*Decim. of* 1 C.
27	.2410714
26	.2321428
25	.2232142
24	.2142857
23	2053571
22	.1964285
21	1875
20	.1785714
19	.1696428
18	.1607142
17	.1517857
16	.1428571
15	.1339285
14	.125
13	.1160714
12	.1071428
11	.0982142
10	.0892857
9	.0803571
8	.0714285
7	.0625
6	.0535714
5	.0446428
4	.0357142
3	.0267857
2	.0178571
1	.0089285

Ounces.	*Decim. of* 1 C.
15	.0083705
14	.0078125
13	.0072544
12	.0066964
11	.0061383
10	.0055803
9	.0050223
8	.0044642
7	.0039062
6	.0033482
5	.0027901
4	.0022321
3	.0016741
2	.0011 60
1	.0055580

Qrs of an Oz.	*Decim. of* 1 C.
3	.0004185
2	.0002790
1	.0001395

Averdupoize little Weight,
Integer being a *Pound.*

Ounces	*Decim. of* 1 lb.
15	9375
14	.875
13	.8125
12	.75
11	.6875
10	.625
9	.5625
8	.5
7	4375
6	.375
5	.3125
4	.25
3	.1875
2	.125
1	.0625

Drams	*Decim. of a* lb.
15	.05859375
14	.0546875

Drams	Decim. of 1 lb.
13	.05078115
12	.046875
11	.04296875
10	.0390625
9	.03515625
8	.03125
7	.02734375
6	.0234375
5	.01953125
4	.015625
3	.01171875
2	.0078125
1	.00390625

Qrs of . Dram	*Decim. of* 1 lb.
3	.0029296
2	.0019531
1	.0009765

Of *Liquid-Meaſure*, the *Integer* being a *Gallon*.

Pints	*Dec. of* 1 *Gall.*
7	.875
6	.75
5	.625
4	.5
3	.375
2	.25
1	.125

Qrs. of a Pint	*Decim. of a Gal*
3	.09375
2	.0625
1	.03125

Of *Dry-Meaſure*, the *Integer* being a *Quarter*.

Buſhels	*Dec. of a Qter.*
7	.875
6	.75
5	.625
4	.5
3	.375
2	.25
1	.125

Pecks	*Dec. of a Qter.*
3	.09375
2	.0625
1	.03125

Qter of a Peck	*Dec. of a Qter.*
3	.0234375
2	.015625
1	.0078125

Pints	*Dec. of a Qter.*
3	.005859
2	.003906
1	.001953

Of *Long-Meaſure*, 1 *Yard* or 1 *Ell* being the *Integer*.

Quarter of 1 *Yard or* 1 *Ell.*	*Decimals of* 1 *Yard or* 1 *Ell.*
3	.75
2	.5
1	.25

Nails

Nails	Decimals of 1 Yard or 1 Ell.
3	.1875
2	.125
1	.0625

Quarters of Nail.	Decimals of 1 Yard or 1 Ell
3	046875
2	03125
1	.015625

Of Reduction of *Inches*, &c. into *Decimals*, the *Integer* being a *Foot* in length.

Inches	*Decimals of a Foot.*
11	.9166666
10	8333333
9	.75
8	.6666666
7	.5833333
6	.5
5	.4166666
4	.3333333
3	.25
2	.1666666
1	.0833333

Qtrs of an Inch	*Dec. of a Foot.*
3	0625
2	.0416666
1	.0208333
½ *Qtr of an Inch*	.0104166

Of *Dozens*, the *Integer* being a *Gross*.

Dozens	*Dec. of a Gross*
11	9166666
10	8333333
9	.75
8	6666666
7	5833333
6	.5
5	4166666
4	3333333
3	.25
2	.1666666
1	.0833333

Parts of a Doz.	*Dec. of a Gross*
11	.076388
10	.069944
9	.0625
8	.055555
7	.048611
6	.041666
5	.034722
4	.027777
3	.020833
2	.013888
1	.006944

Of *Time*, a *Day* being the *Integer*

Hours	*Decim. of a Day*
23	.9583333
22	.9166666
21	.875
20	.8333333

Hours	*Dec. of a Day.*
19	.7916666
18	.75
17	.7083333
16	.6666666
15	.625
14	.5833333
13	.5416666
12	.5
11	.4583333
10	.4166666
9	.375
8	.3333333
7	.2916666
6	.25
5	.2083333
4	.1666666
3	.125
2	.0833333
1	.04 6666

Minutes	*Dec. of a Day.*
59	.0409722
58	.0402777
57	.0395833
56	0388888
55	,0381944
54	.0375
53	.0368055
52	0361111
51	0354'66
50	0347222
49	0340277
48	0333333
47	0326388
46	0319444
45	0312500

Minutes	*Dec. of a Day.*
44	.0305555
43	.0298611
42	.0291666
4	.0284722
40	0277777
39	.0270833
38	0263888
37	.0256944
36	.0249999
35	.0243055
34	.0236111
33	.0229166
32	.0222222
31	.0215277
30	.0208333
29	.0201388
28	.0194444
27	.01875
26	.0180555
25	.0173611
24	0·66666
23	.0159722
22	.0152777
21	.0145833
20	.0138888
19	.0131944
18	.0125
17	.0118055
16	.0111111
15	0104166
14	0097222
13	0090277
12	.0083333
11	0076388
10	0069444
9	.00625

8

Minutes	*Dec. of a Day.*	*Minutes*	*Dec. of a Day*
8	.0034722	4	.0027777
7	.0048611	3	.0020833
6	.0041666	2	.0013888
5	.0034722	1	.0006944

To reduce the known Parts of Money, Weight, Meaſure, Time, &c. to Decimal Fractions.

Hence it is evident, that the known Parts of *Money*, *Weight*, *Meaſure*, *Time* and *Motion*, *&c.* may be reduced to *Decimal Fractions* of the ſame Value or infinitely near it; for if in *Money*, a *Pound Sterling* be an *Integer*, whatſoever is leſs than a *Pound*, is either a Part or Parts of the ſame; and when you know what Part or Parts thereof it is, you may reduce it to a *Decimal* of the ſame Value, as in the Examples following.

But becauſe it ſometimes happens, that a Cypher or more is to poſſeſs the Firſt, Second, *&c.* Places of the *Decimal* toward the Left Hand, therefore take this Rule.

As many Cyphers as you have in the Third Number of the 3 in proportion as in this Example: What is the $\frac{1}{8}$ in a *Decimal Fraction*, ſo many Places you muſt prick off in the *Quotient* towards the Right Hand.

```
8 ——————— 1 ——————— 1000
                       1
                    ————————
                    8)1000(.125
                       •••
                      8
                     ————
                      20
                      16
                      ————
                       40
                       40
                       ——
                       00
```

How is 9 *d.* expreſs'd in the *Decimal* of a *Pound*?

RULE, Conſider that in a *Pound* are 240 *Pence*, therefore 9 *d.* is $\frac{9}{240}$ in a *Vulgar Fraction*, for 9 *d.* is $\frac{9}{12}$ of $\frac{1}{20}$ of a *Pound*.

Then ſay as in the laſt Example, and that will ſhew in the *Quotient* what Part of a *Pound* 9 *d.* is in the *Decimal*, as you may find it in the Table.

```
  d.            d.           Decimals
 240 ——————————— 9 —————————— 10000
                                  9
                             ———————
                         240)90000(.0375
                             72
                             ———
                             180
                             168
                             ———
                              120
                              120
                              ———
                              000
                              ———
```

In the laſt Example becauſe I had 4 Cyphers in the Third Number, therefore I muſt prick 4 Places off toward the Right Hand in the *Quotient* for *Decimals*; but becauſe the ſaid *Quotient* did but conſiſt of 3 Places, therefore I ſupply the Fourth toward the Left Hand with a Cypher.

NOTE, That the greater your Third Number is in the Stating, the nearer do you bring your *Decimal* to Truth, when any Thing happens to remain as in the Examples following; but in moſt Caſes where the *Decimal* is not to be multiplied by a great Number, it is ſufficient that the Third Number be 1000.

But when you reduce $\frac{1}{4}$ or $\frac{1}{2}$ or $\frac{3}{4}$ to *Decimals*, or any Number of *Shillings* to the *Decimal* of a *Pound*, it is ſufficient in theſe Caſes if your Third Number be 100.

If you find any Queſtion in any Author that the *Decimal* does not anſwer your Anſwer in the Table, you muſt add as many Cyphers to the Right Hand of your Third Number, as there are Figures wanting in the *Quotient*, to make the *Quotient* even to the Anſwer of the Table.

And if any Thing remains at any *Diviſion*, it is inconſiderable, being leſs than $\frac{1}{10000}$ Part of an Unit or 1.

How is 3 *Farthings* wrote in the *Decimal Fraction* of a *Pound Sterling*, the *Fraction* $\frac{3}{960}$.

```
Farthings in a l.   Farthings   Decimal
960 ——————————————— 3 ————————— 1000000
                                      3 Decimal of a l.
                               ———————
                         960)3000000(.003125
                             2880
                             ————
                              1200
                               960
                              ————
                              2400
                              1920
                              ————
                              4800
                              4800
                              ————
                              0000
                              ————
```

There is 6 Cyphers in the *Dividend*, and but 4 Figures in the *Quotient*, which is the *Decimal* of a *Pound*, I add (as before is mentioned) 2 Cyphers to the Left Hand in the *Quotient*, to make the *Quo-*

tient conſiſt of as many Places as there are Cyphers in the *Dividend.* See the Proof in the Table.

The Anſwer in this *Decimal* Queſtion, is .003125 or 3125 *Millions Parts of a Pound.*

How is 13 *Shillings* in the *Decimal* of a *Pound?* In a *Vulgar Fraction* 13 is $\frac{13}{20}$ ths, and in a *Decimal* 65 *Hundred Parts* of a *Pound.*

s. *s.* *Decimal.*
20 ——— 13 ——— 100
Anſwer, .65 *Hundred Parts of a Pound*

How is 14 *s.* 6 *d.* in the *Decimal* of a *Pound?* In 14 *s.* 6 *d.* are 174 *d.* the *Decimal* of 14 *s.* is 7 *tenth Parts of a Pound,* and the *Decimal* of 6 *d.* is .025 *Thouſand hundred Parts of a Pound,* which added together, make .725, as in the Table aforegoing.

The *Fraction* $\frac{174}{240}$.
240 ——— 174 ——— 1000
Anſwer, .725 *Thouſand Hundred Parts.*

How is 7 *Shillings* in the *Decimal* of a *Pound?*
Shill. *Shill.* *Decemals*
20 ——— 7 ——— 100
Anſwer, .35 *Decimals of* 1 *Pound,* as in the Table.

How is 3 *d.* in the *Decimal* of a *Pound?*
3 *d.* is the $\frac{3}{12}$ of $\frac{1}{20}$ or $\frac{3}{240}$; then ſay,
d. *d.* *Decimals*
240 ——— 3 ——— 10000
Anſwer, .0125 *of* 1 l.

Likewiſe if there were given 7 *s.* 3 *d.* to find the *Decimal* thereto, 7 *s.* 3 *d.* is 87 *d.* which is $\frac{87}{240}$ of 1 *l.* and the *Decimal* thereto will be found to be .3625 *l.*
d *d.* *Decimal.*
240 ——— 87 ——— 10000
Anſwer, .3625 *of a Pound.*

Or if you had added the foregoing *Decimals* together, you would have had the ſame *Product.*

l
.35 *Decimal* of 7 *s.*
0125 *Decimal* of 3 *d.* makes
.3625 whole *Decimal.*

How is 15 *Ounces* in the *Decimal* of a *Pound* expreſſed (1 lb. is 16 *Ounces*) *Fraction* $\frac{15}{16}$ *Averdupoize* little Weight?

oz. oz. *Decimals.*
16 ———— 15 ———— 10000
Anſwer, .9375 *Decimals of a* lb.

How is 7 lb. expreſſed in the *Decimal* of a *Hundred weight*, *Fraction* $\frac{7}{112}$?
112 lb —— 7 lb —— 10000 *Decimals* ſuppoſed.
Anſwer, .0625 *Decimal of* 1 *Hundred-weight.*

How is 59 *Minutes* expreſſed in the *Decimal* of a *Day*? I conſider there is 1440 *Minutes* in 1 *Day*, the *Fraction is* $\frac{59}{1440}$ of a *Day*.
1440 *Min.* —— 59 *Min.* —— 10000000 *Decimals.*
Anſwer, .0409722 *Decimals* equal to 59 *Minutes.* 320 remains, which is leſs than the $\frac{320}{100000000}$ Part of an *Unit* or 1.

How is 11 *Inches* expreſſed in the *Decimal* of 1 *Foot*? *Fraction* $\frac{11}{12}$ of 1 *Foot.*
12 *Inch.* 1 *Foot.* —— 11 *Inches* — 10000000 *Dec. of* 1 *Foot.*
Anſwer, .9166666 — 8 Remains, which is leſs than $\frac{8}{1000000000}$ of an *Unit* or 1

How is 23 *Hours* in a *Decimal* of a *Day*? *Fraction* $\frac{23}{24}$ of a *Day.*
24 *Hours in* 1 *Day* — 23 *Hours* —— 10000000 *Decimal.*
Anſwer, 9583333 *Decimals of a Day.*

How is 15 *Pennyweights* expreſſed in the *Decimals* of an *Ounce*?
20 *pwts in* 1 *oz.* ——— 15 *pwts.* ——— 100 *Decimals.*
Anſwer, .75 *Decimal.*

How is 23 *Grains* expreſſed in the *Decimal* of 1 *Ounce*, 480 *Grains* in 1 *Ounce*?
480 *Grains* ——— 23 *Grains* ——— 10000000 *Decim.*
Anſwer, .0479166 *Decimals.*

How is 3 *Nails* expreſſed in the *Decimal* of a *Yard*? The *Fraction* $\frac{3}{16}$.
16 *Nails* ——— 3 *Nails* ——— 10000 *Decimals*
Anſwer, .1875 *Decimals of* 3 *Nails.*

How is 3 *Pecks* in the *Decimal* of a *Quarter*? *Fraction* $\frac{3}{32}$.

32 *Pecks in* 1 *Qter.*—3 *Qter*———100000 *Decimals.*

Anſwer, .09375 *Decimal of* 3 *Pecks.*

How is 7 *Buſhels* expreſſed in the *Decimal* of a *Quarter*, 8 *Buſhels* 1 *Quarter?* *Fraction* $\frac{7}{8}$.

8 *Buſhels*———7 *Buſhels*———1000 *Decimals.*

Anſwer, *Decimal.* 175 *of* 7 *Buſhels.*

How is 14 *Drams* expreſſed in the *Decimal* of a *Pound-weight*, 256 *Drams* in a *Pound-weight* ?

256 *Drams*———14 *Drams* ———10000000 *Decim.*

Anſwer, .0546875 *Decimals of* 14 *Drams.*

How is $\frac{3}{4}$ of a *Dram* expreſſed in the *Decimal* of a *Pound?* *Fraction*, $\frac{3}{1024}$.

256 *Drams.*
4 *Quarters*

———— *Qters* *Decimals.*

1024——————3——————10000000

Anſwer, .0029296 *Decimals of* $\frac{3}{4}$ *of a Dram.*

896 *remains, which is leſs then* $\frac{896}{10000000}$ of 1 *Unit.*

How is $\frac{3}{4}$ of an *Inch* expreſſed in the *Decimal* of a *Foot*, 48 *Quarters* in 1 *Foot?*

48 *qrs* ——————3 *qrs* ——————10000 *Dec.*

Anſwer, .0625 *Decimals of* $\frac{3}{4}$ *of* 1 *Inch.*

How is 7 *Pints* expreſſed in the *Decimal* of 1 *Gallon*? *Fraction* $\frac{7}{8}$.

8 *Pints*———7 *Pints*—————1000 *Decimals*

Anſwer, .875 *Decimals of* 7 *Pints.*

How is 2 *Quarters* expreſſed in the *Dec.* of 1 *Yard*?

4 *qrs*——————2 *qrs*——————10 *Decimal.*

Anſwer, .5 *Decimal of* 2 *Quarters.*

How is $\frac{3}{4}$ of a *Peck* expreſſed in the *Decimal* of a *Quarter?*

8 *Buſhels*
4 *Pecks*
————
32 *ditto*
4 *Quarters*
————
128

128——3——10000000 *Decimals*

Anſwer, .0234375 *of* $\frac{3}{4}$ *of a Peck.*

How

128 *Qters* of a *Peck* in (8 *Buſh.*
4 *Pints*
——
512 *Pints*

How is 3 *Pints* expreſſed in the *Decimal* of a *Quarter* or 8 *Buſhels* ?

512 *Pints* ———— 3 *Pints* ———— 100000 *Decimals.*

Anſwer, .05859 *Decimals of* 3 *Pints of* 1 *Quarter. And* 192 *remains, which is leſs than* $\frac{192}{100000}$ *of* 1 *Unit.*

How is 11 *Dozen* expreſſed in the *Decimal* of a *Groſs* ? *Fraction* $\frac{11}{12}$ of a *Groſs.*

12 *Groſs* ———— 11 *Dozen* ———— 10000000 *Decim.*

Anſwer, *Decimal* .9166666 remains 8.

12 *Dozen*
12 *Parts in* 1 *Dozen*
——
144 *Parts*

How is 11 Parts of a *Dozen* expreſſed in the *Decimal* of a *Groſs* ?

144 *Parts* ———— 11 *Parts* ———— 10000000 *Decimals.*

Anſwer, .0076388.

How is 6 *Ounces* 12 *Pennyweight* expreſſed in the *Decimal* of a *Pound Troy* ?

6 *oz.* 12 *pwts.*
20 *pwts.*
——
132 *Pennyweights*
——*Fractions*
240 *ditto in a* lb *Troy.*

pwts	*pwts*	*Decimal.*
240 ————	132 ————	100

Anſwer, .55 *Decimal of a* lb.

How is 12 lb. expreſſed in the *Decimal* of 1 C. or 112 lb ? The *Vulgar Fraction* is $\frac{12}{112}$, therefore work as before.

112 lb ———— 12 lb ———— 10000 *Decimals*

Anſwer, .1071 *Decimals of a* lb. 48 remains, *which is inconſiderable, being leſs than* $\frac{1}{10000}$ *Part of an Unit.*

How is 7 *Farthings* expreſſed in the *Decimal* of a *Pound* ? *Fraction* $\frac{7}{960}$.

960 *Farth.* ———— 7 *Farth.* ———— 10000000 *Decimals*

Anſwer, .0072916 *Decimals of a Pound*, according to the Table. Remains 540, *which is leſs than* $\frac{1}{10000000}$ *Part of an Unit.*

NOTE, That you may by the Rule following write down any Number of *Shillings* in the *Decimal* of a *Pound* without any Proportion.

RULE. If your *Shillings* are an even Number, half of them is the *Decimal* of a *Pound*, but if they are odd, put a Cypher to the Right Hand, and then the half is the *Decimal* of a *Pound*, 14 *s.* in 7 *l.* 16 *s.* is 8 *l.* *&c.* likewiſe 13 *s.* or 130 is 65 *l.* 15 *s.* or 150 is 75 *l.* *&c.*

You may likewiſe write down any Number of *Pence* or *Farthings* in the *Decimal* of a *Pound*, without working by the foregoing Rules.

For if you reduce the given *Pence* into *Farthings*, and place a Cypher to the Left Hand, you have the *Decimal* of a *Pound* required; but if the ſaid *Farthings* exceed 14, you may add one (for Reaſon given in the next Caſe) and another, for each 39 *Farthings*.

Example for Pence.

d.	*Deci.*	*d.*	*Deci.*
3 is	.012 *l.*	9 is	.037 *l.* *&c.*

To find the Value of a Decimal in the known Parts of Money, Weight, Meaſure, &c.

Multiply the *Decimal* given, by ſuch a Number of *Units* of the next inferior Denomination, as makes a *Unit* of that your *Decimal* is of, and prick from the Right Hand of the *Product*, ſo many Places as your *Decimal* conſiſteth of; ſo thoſe towards the Left Hand the ſaid Point or Prick are *Integers*, and thoſe to the Right Hand, are Parts of a *Unit* of thoſe *Integers*.

MONEY.

Decimal	*Decimal*	*Decimal*
35 *l.*	.7635 *l.*	0072916 *l.*
20 *Shil.*	20	20 *s.*
Shill. 7|00	*Shill.* 5|2700	0.1458320
	12	12 *d.*
	Pence 3|2400	*d.* 1|7499840
	Parts of a Penny.	4
		Far. 2|9999360

In this Example you ſee, That the Value of .0072916 is 1 *d.* ½, and the Parts being another *Farthing*, wanting leſs than an Hundredth Part of a *Unit*, you may call the Value 7 *Farthings.*

WEIGHT.

Decimal	*Decimal.*
.1071 *Hund. weight*	.0029296 *Pounds*
4 *Quarters*	16 *Ounces*
.4284	0175776
28 *Pounds*	0029296
34272	0.0468736
8568	16 *Drams*
lb. 11|9952 Mind the laſt Queſtion on the other Side, it wanting leſs than the Hundred Part of 1 *Unit*, you may call it 12 *Pound.*	2812416
	0468736
	0.7499776
	4 *qrs of D.*
	qrs 2|9999104 it wanting leſs than 1 Hundred Part of 1 *Unit*, it may be called 3 *Quarters of* 1 *Dram.*

TROY WEIGHT.

Decimal
.0479166 *Ounces*
480 *Grains*
in 1 Oz.

38333280
1916664

Grains 22|9999680

It wants not the Hundredth Part of 1 *Unit*, ſo that you may call it 23 *Grains*,

Decimal
.75 *Ounces*
20 *Penwts* 1 Oz.

Penwts 15|00

Decimal
.55 *Pounds*
12 *Ounces*

Ounces 6|60
20

pwts 12|00

TIME.

Decimal
.9583333 *Day*
24 *Hours*

38333332
19166666

Hour 22|9999992

It wants not the Hundredth Part of 1 *Unit*, and you may call it 23 *Hours*

Decimal
.0409722 *Day*
1440 *Min.* 1 *d.*

16388880
1638888
409722

Min. 58|9999680

It wants not the Hundredth Part of 1 *Unit*, and you may call it 59 *Minutes*.

DRY MEASURE.

Decimals
.0234375 *Quarters*
8 *Buſhels*

1875000
4 *Pecks*

7500000
4 *qters of Peck*

qters 3'0000000

Decimals
.005859 *Quarters*
512 *Pints*

011718
005859
29295

Pints 2|999808

It's leſs than 1 Hundred Part of a *Unit*, therefore you may call it 3 *Pints*.

LIQUID MEASURE.

Decimals
.875 *Gallons*
8

Pints 7.000

LAND MEASURE.

Decimal
.9166666 *Feet*
12 *Inches*

Inches 10 9999992

It's leſs than the Hun-
redth Part of 1 *Unit*, and
herefore you may call it
1 *Inches*.

Decimal
.0625 *Foot*
48 *Qters of an Inch in 1 Foot*

5000
2500

Inch
qrs of 1--3|0000

There is a briefer Way of diſcovering the Value of a *Decimal* of a *Pound Sterling*, *viz.* The Figure which ſtandeth in the firſt Place of the *Decimal* (*viz.* in the Place of *Primes*) being doubled, gives you the Number of *Shillings*; then let the Figure poſſeſſing the Second Place of the *Decimal* (*viz.* the Place of *Seconds*) be eſteemed ſo many *Tens*, and the Figure in the Third Place account ſo many *Units*; which ſaid *Tens* and *Units* being accounted one entire Number, and made leſs by one (as ſuppoſe it was 36 to be but counted 35) the 35 will be ſo many *Farthings*, which ſaid *Shillings* and *Farthings* are the Value of the given *Decimal*; but if the Figure in the Second Place be 5, or elſe exceed 5, then reckon one for that, and for the Exceſs above 5 eſteem every *Unit Ten*, as before.

EXAMPLE.

What is the Value of .7365 *l.*

The Figure 7 ſtanding in the Place of *Primes* being doubled, gives 14, which is ſo many *Shillings*, and the Figure in the Second Place, which is 3, being accounted ſo many *Tens*, is 30; and the Figure in the Third Place, *viz.* 6, being eſteemed *Units*, and annexed to the *Tens* aforeſaid, makes 36, which being leſſened by one, makes 35 *Farthings*, which is 8 *d.* $\frac{3}{4}$ So is 14 *s.* 8 *d.* $\frac{3}{4}$, the Value of the given *Decimal* .7365 *l.*

```
          20
      ---------
s. 14|7300
     |  12
      ---------
d.  8|7600
     |   4
      ---------
Far. 3|0400
```

EXAMPLE.

What is the Value of .8896 *l.*

The firſt Figure (8) being doubled makes 16, and becauſe the next Figure is above 5, I add one to 16, which makes 17 *s.* then the Exceſs of the Second Figure above 5 being 3, I eſteem it ſo many *Tens*; and the Figure 9 in the Third Place being *Units* makes 39, which being leſſen'd by one makes 38 *Farthings*, which is 9 *d.* ½, ſo is 17 *s.* 9. ½ the Value of the given *Decimal* .8896 *l.* and after this Manner may the Value of any *Decimal* of a *Pound Sterling* be diſcovered at firſt Sight without Loſs of a *Farthing*. *Decimal* .8896 *l.*

20
ſhil. 17|7920
12
d. 9|5040
4
Far. 2|0160

ADDITION.

There is no Difference between *Addition* of *Decimals* and whole Numbers of one Denomination, only obſerving the *Decimals* Point under Point, as in the Examples, and prick ſo many of the Sum, as are in the greateſt Number of Places in the *Decimal* given.

GENERAL RULE.

When Two or more *Decimals* are given to be added together, you are ſo to diſpoſe of them one under the other, as that all the Figures on the Le Hand may ſtand in Order one under the other that is to ſay, *Primes* under *Primes*, or *Tens* unde *Tens*, (whether they be Cyphers or ſignificant Figures) and *Seconds* or *Hundreds* under *Seconds* or *Hundreds*, *&c* obſerve the ſame Order if they conſi ſome of never ſo many Places, and others of neve ſo few.

EXAMPLES.

Decimals	*Decimals*	*Decimals*
.00746	.987	.39462
.0832	.3642	.0013
.62	.853	.99
.8	.9761	.176
Integer 1 .51066 *Parts of an Integer or* 1	*In*.3.1803	*Int*.1.56192

The Firſt Example towards the Left Hand is as the reſt, only I demonſtrate the working; Firſt, I put 6 under the Line, becauſe there is no other Figure or Number to add to it; then I proceed and ſay 2 and 4 make 6, which I put under the Line; then I ſay 3 and 7 make 10, ſo I ſet down an 0, and carry 1 to the next; ſay 1 that I carry and 2 and 8 make Eleven, for which I ſet down 1, and carry 1; ſaying one that I carry and 8 and 6 make 15, which I put in its Place under the Line, becauſe it is the laſt, and becauſe the Figure 5 ſtandeth under the Place of *Primes*, I put a Point before it, that is to ſay, between 2 and 5 and the Work is done; the Number 1 being an *Integer*, and the reſt a *Decimal*. Whereby I find the Sum to be 1.51066, that is 1 *Integer*, or 1 and 51066 Parts of an *Integer*, and ſo all the reſt of the Examples.

Int.	*Decimals*
4	.368 *l.*
16	.07 *l.*
26	.009 *l*
42	.8 *l.*
Pounds 89	.247 *Dec'm.* of 1 *l.*

Inte.	*Decimals*
748	.
36	.72 *l.*
9	.564 *l.*
	.7358 *l.*
l. 795	.0198 *Dec.*

You ſee the working of theſe mixt *Additions*, the *Integers* are *Pounds Sterling*, and the *Decimals*, *Pounds*, which being worked according to the Rules in *Reduction*, would be found to be *Shillings*, *Pence*, and *Farthings* ; as for Example, The Firſt Sum towards the Right Hand is *l.* 89. 247 *l.* or *Decimal* Parts of 1 *l. Sterling*.

247 *l.* which is 89 *l.* 4 *s.* 11 *d.* $\frac{1}{4}$
20.

Shill. 4|940
|12

Pence 11|280
|4

Farthings 11|20

Subſtraction of Decimals.

Place your Numbers as in the laſt, and proceed as in *Addition*.

EXAMPLE.

	Decimal
Lent	.728 *l.*
Paid	.648
Remains.	80 *l.*

	l.	*Decimal*
Lent	160	.99 *l.*
Paid	94	.8462 *l.*
Rem.	66	.1438

	l. *Dec.*
Lnt	389 .0
Paid	0 .346
Re.	388.654

When the *Decimal* given to be ſubſtracted does no conſiſt of an equal Number of Places, ſuch Defe muſt be ſupplied by annexing Cyphers, or ſuppoſin as many Cyphers to be annexed (as are wanting) o the Right Hand, and then the Work will be as i the former Examples.

Let it be required to ſubſtract .2784 *Decima* from .3479 *Decimal.*

Subſtract 15.486 from .64 *l.*

	l.	*Decimals*		*Decimals*		*l.*	*Decim.*
	64	.000	Lent	.3479 *l.*	Lent	84	.6
	15	.486	Paid	.2784 *l.*	Paid	15	.0752
Rem.	48	.514	Rem.	.0695	Rem.	69	.5248

Multiplication of Decimals.

In this Rule you are to place the Factors, and work as in whole Numbers; but after you have found the *Product*, obſerve this General Rule.

As many Decimal Places as you have in both the Factors, ſo many Places muſt you prick off toward the Right Hand of the *Product*; and if ſo many Places happen not to be contained in the ſaid *Product* (as it will happen when you multiply Two *Fractions* together that are of little Value) you are to make up the Number by Cyphers towards the Left Hand.

The Reaſon of this Rule is plain, it differing nothing from that given for multiplying *Vulgar Fractions*; for by multiplying the Sums given together, you multiply the *Numerators*; and by cutting off as many as are in both *Decimals* given, you multiply the *Denominators* and divide that of the *Numerators* by the *Product* of the *Denominators*: Thus, to multiply $\frac{1}{2}$ by $\frac{3}{4}$ is the ſame as .75 by 5, and 100 by 10, *viz.* $\frac{75}{100}$ by $\frac{5}{10}$; for 5 times 75 is 375, and 10 times 100 is 1000; ſo the *Product* by the $\frac{375}{1000}$ or 375.

Look how many *Decimal* Places are in both the *Factors*, viz. *Multiplicand* and *Multiplier*, ſo many *Decimal* Places muſt be in the *Product*.

Wherefore cut off ſo many Figures from the Right hand of the *Product* for *Decimals*, and the Figure or Figures remaining on the Left-hand (if there be any) are *Integers*.

Now obſerve as many *Decimals* as you have in the *Multiplicand* and *Multiplier*, ſo many muſt you cut off toward the Right-hand, as in this Example: You find I had 5 Figures, as before is told, and ſo many I cut off. See the Work.

```
Multiply   3.467
by        19.01
         ------------
            3467
        31203
        3467
         ------------
Integer 65.90767 Decimal.
```

A *whole Number* 36492	A *Decimal* .13461
by a *Decimal* .032	by a *whole Number* 42
72984	26922
109476	53844
Int. 1167.744 *Dec.*	*Int.* 5.65362 *Dec.*

Now in this *Example* there is more *Decimal* Places in the *Multiplicand* and *Multiplier* than in the *Product*: Therefore I annex a *Cypher* toward the Left-hand to make it conſiſt of as many Places as is before expreſs'd. See the Work.

.1264 *Decimals*
.247

8848
5056
2528

.03122.08

.01832 *Decim.*
.007

.00012824 as in the laſt.

.048 *Decimals*
.12

.00576

Diviſion of Decimals.

Diviſion is the ſame with that of whole Numbers: All the Difficulty thereof is, to know how many *Decimal* Places to prick off towards the Right-hand in the *Quotient*; for which take this Rule.

Take notice how many *Decimal* Places you have in the *Dividend*, and how many in the *Diviſor*, and how many the difference is; ſo many Places muſt you prick off to the Right-hand of the *Quotient*, but if ſo many Places are not in the *Quotient* as the ſaid difference, make up the Number by prefixing *Cyphers* toward the Left-hand.

Decimal Fractions may alſo be divided as vulgar, as $\frac{75}{100}$ by $\frac{125}{1000}$ quotes $\frac{75000}{12500}$, or 6.

Note, That in the following and moſt other Examples in *Diviſion of Decimals*, it will be neceſſary to place *Cyphers* toward the Right-hand of the *Dividend*, and that you may know what Number of *Cyphers* to put to the Right hand of any *Dividend*, obſerve the Rule following.

Di-

```
        Dividend      Diviſor
Divide 12 .43210  by  9 .465
```

A mixt Number given to be divided by a mixt Number.

```
                        Int. Dec.
  9 .465) 12 .43210 (1 .31
           9 .465
          -------
           29671
           28395
          -------
            12760
             9465
          --------
            3295
```

Remains being leſs then the $\frac{10}{10000}$ Part of 1 *Unit.*

GENERAL RULE.

After the Work of the *Diviſion* is ended, conſider how many *Decimal* Places are in the *Dividend* more than there are in the *Diviſor*; and how many ſoever the Exceſs is, let ſo many in the *Quotient* be ſeparated from the reſt for a *Decimal.* But if there are not ſo many Figures in the *Quotient* as the ſaid Exceſs is, ſuch Defect muſt be ſupplied by prefixing as many *Cyphers* on the Left-hand, putting a Point before them, as hath been ſaid already, then ſuch *Decimal* as aforeſaid will be the true Value of the *Quotient* ſought.

RULE, Conſider how many *Decimal* Places you would have in the *Quotient* (as 3 is ſufficient, if it is not afterward to be multiplied by any thing) and alſo how many *Decimal* Places you have in your *Diviſor*; and ſo many as you have in both, make ſo many *Decimal* Places in the *Dividend* by adding *Cyphers*, if need require, as in the following Example; where 3 .46 is devided by 1 .47, and becauſe I would have

3 *Decimals* in the *Quotient*, and there are 2 in the *Diviſor*, I muſt make 5 *Decimal* Places in the *Dividend*, by prefixing to the Right-hand of the *Dividend* 3 *Cyphers*.

A mixt Number by a mixt Number.

```
                Int. Decimal
1 .47) 3 .46000 (2 .353
       2 .94
       -----
         520
         441
        -----
          790
          735
         -----
           550
           441
          -----
           109
```

Remains being leſs than the 1000th part of an *Unit*.

A Decimal Table.

I ſhall explain this Rule by the following Examples of the ſeveral Caſes, as may happen in the *Diviſion of Decimals*, which are 9 as followeth.

1	*A whole Number*	being given to be divided by	*a whole Number.*
2			*a mixt Number.*
3			*a Decimal Fraction.*
4	*A mixt Number*		*a whole Number.*
5			*a mixt Number.*
6			*a Decimal Fraction.*
7	*A Decimal Fraction*		*a whole Number.*
8			*a mixt Number.*
9			*a Decimal Fraction.*

A

A whole Number given to be divided by a whole Number.

Divide 5729 by 438.

When you are to divide one whole Number by another, and they are not commenſurable, tho' there are no *Decimals* in either the *Dividend* or the *Diviſor*; yet if you annex a competent Number of *Cyphers* to the *Dividend*, there will be a *Decimal* in the *Quotient* conſiſting of as many Places as you annexed *Cyphers* to the *Dividend*.

```
Diviſor  Dividend     Quotient
                      Int. Decimal
 438) 5729 .0000 (13 .0799
      438
      ----
      1349
      1314
      ----
        350
        000
       ----
       3500
       3066
       ----
        4340
        3942
        ----
         3980
         3942
         ----
           58
```

Now to find out the Value of the *Quotient* by the General Rule beforegoing, I conſider there are no *Decimals* in the *Diviſor*, but there are 4 in the *Dividend*, and conſequently by the ſaid Rule there muſt be 4 *Decimal* Places noted out in the *Quotient* by ſetting a Point before them, and then the true Value of the *Quotient* will be found to be 13 *Integers* 0799 Parts of an *Integer*.

A whole Number given to be divided by a mixt Number.

Diviſor *Dividend.* *Quotient.*
Int. *Int.Decimal.*
39.4865)586.000000(14.84
394865··

1911350
1579460

3318900
3158920

1599800
1579460

19340 Remains.

The Exceſs of the *Dividend* being 2 Figures more than the *Diviſor*, I cut off 2 Figures in the *Quotient* for the *Decimals*, and it is found to be 14 *Integers*, and .84 *l. Decimals* with Remainder 19340, which is leſs than the $\frac{19340}{100000}$ part of 1 *Integer*.

Let there be 2 given for a *Dividend* to be divided by the mixt Number 28.74, to make up the *Dividend* I annex 6 *Cyphers*, and work as before.

EXAMPLE.

Quotient.
28.74)2.000000(.0695 *Decimals*.

Now to find the true Value of this *Quotient* according to the General Rule. The Exceſs is 4 *Decimals* in the *Dividend* more than in the *Diviſor*, there muſt be 4 *Decimals* in the *Quotient*, but there is but 3; therefore I make 4 by putting a *Cypher* to the Left-hand; as you may ſee in the *Quotient* aforegoing.

A

A whole Number given to be divided by a *Decimal Fraction.*

```
                         Diviſor.   Dividend.
                                  whole Numb. Int. Dec.
       Decimal Fraction .0675)48.0000000(711.111
                              4725 ..:..
                              ----
                               750
                               675
                               ----
                                750
                                675
                                ----
                                 750
                                 675
                                 ----
                                  750
                                  675
                                  ----
                                   750
                                   675
                                   ----
                                    75
```

The Exceſs being three Figures, I cut off three in the Quotient. See the Work above.

A Mixt Number given to be divided by a Decimal Fraction.

```
               Dividend.
   .3468)54.379000000(156.7705
```

The Exceſs is 4 *Decimals*, which I point off in the *Quotient*.

156 *Integers* .7705 *Decimal* parts of an *Integer*.

A mixt Number given to be divided by a whole Number.

```
   Diviſor    Dividend    Quotient
      75) 743.57400 (9.91432
```

There being 5 *Decimals* in the *Dividend* and none in the *Diviſor*, I note off 5 in the *Quotient*. See the Work aforegoing.

A *Decimal Fraction* given to be divided by a whole Number.

Fraction. Quotient.
25) .07864 (.00314

But there ſhould be 5 *Decimal* Places, therefore I annex 2 *Cyphers*.

A *Decimal Fraction* given to be divided by a mixt Number.

Mixt Number. Decimal. Decimals
3.476) .846000 (2433

A *Decimal Fraction* given to be divided by a *Decimal Fraction.*

Decimal.
.243) .835796 (.3439

The Rule of Three in Decimal Fractions.

In the *Rule of Three in Decimals*, the Operation is in every Reſpect the ſame as in whole Numbers, ſo is it in all the Parts or Rules of *Arithmetick* ; only, when you work in *Decimals*, you muſt have reſpect to the *Decimal Rules* before taught ; for in *Decimals* you muſt add, ſubſtract, multiply and divide, when, and after the ſame manner as you do in whole Numbers. A few Examples will make you perfect in the Knowledge thereof.

If 1 lb. $\frac{3}{4}$ of *Tobacco* coſt 2 *s.* 6 *d.* how much will 326 lb. $\frac{1}{4}$ coſt at that Rate ?

When the Fractional Parts of the Numbers in this Queſtion are turned into *Decimals*, then it will be read thus.

If 1.75 lb. of *Tobacco* coſt 3.5 *s.* how much will 326.25 lb. of the ſame coſt at that Rate.

```
      lb.              s.              lb.
If 1.75 ——————————— 3.5 ——————————— 326.25
                                       3.5
                                   ————————
                                    163125
                                   97875
                                   ————————    l.  s.
                        1.75) 1141.875 (652.5
                               1050        12
                              ——————      ————
                                 918     d. 6.0 dec.
                                 875
                                —————
                                  437
                                  350
                                 —————
                                   875
                                   875
                                  —————
                                     0
                                  —————
```

   l.   *s.*   *d.*
Or 32 — 12 — 6 the ſame as in whole Numbers.

You muſt take care to cut off the *Decimals* in *Multiplication* and *Diviſion*, as aforeſaid.

If 9 C. of *Tobacco* coſt 25 *l.* 7 *s.* what will be the Price of 17 C. of the ſame at that Rate?

```
     C.              l.                C.
   If 9 ——————————— 25.35 ——————————— 17
                     17
                  ———————
                   17745
                   2535
                  ——————— l. Decimal.
               9) 430.95 (47.880
                   36
                  ————
                    70
                    63
                   ————
                     79
                     72
                    ————
                      75
                      72
                     ————
                       3
                     ————
```

By prefixing a *Cypher* to the *Decimal*, I find it to be 17 *s.* 8 *d.*

Anſwer, 47 *l.* 17 *s.* 8 *d.*

If an Ounce of Gold be worth 2 *l.* 19 *s.* 4 *d.* I demand the Price of 19 *oz.* 3 *pwts.* 5 *gra.* at that Rate.

Firſt find the *Decimals* of the Numbers in the Queſtion.

oz. *pwts.* *gra.*
19——3——5

The *Decimal* of 3 *Pennyweights* is 15
The *Decimal* of 5 *Grains* is 010416

oz. 19.160416

oz. *l. Dec.* *oz. Dec. of an* Ounce.
If 1——2.9666——19.160416
2.9666

114962496
114962496
114962496
172443744
38320832

l. 56.8412901056 *Decimal.*

59 1/3 2 19/20
19
53 1
59
1127 1/19
6 19
s: 1127 1/19.
56.7 1/19

l. *s.* *d.*
I find it to be 56—16—10.

F I N I S.

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